

REFLECTIONS

ON THE

WORKS OF GOD,

AND OF HIS

PROVIDENCE,

THROUGH OUT

ALL NATURE,

FOR

EVERY DAY IN THE YEAR.

TRANSLATED FIRST FROM THE GERMAN
OF MR. C. C. STURM,

BY A LADY.

VOL. III.

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REFLECTIONS, &c.

SEPTEMBER I.

THE OMNIPRESENCE OF GOD.

THOU art present every where, O Almighty God! Thou art near. Thou art afar off. Thou fillest the whole universe. Here grows a flower; there shines a sun. Thou art in the wind, and in the tempest; in the light, and in darkness; in an atom, and in a world. Thou art present upon this flowery vale. Thou hearest my weak voice, as thou hearest (at the foot of thy throne) the sublimest song which are accompanied by the seraph's lyre. O who art the God of the seraphim! who art also my God; who hearest us both; who hearest the sprightly notes of the lark, the hum of the young bee that flutters round the rose: thou Being that art present every where! if thou hearest me, vouchsafe to grant my request, that I may never forget my being in thy sight. Grant that I may act and think as I ought to do in thy presence, to the end, that, when summoned with the whole world of spirits before the tribunal of my Judge, I may not be obliged to fly from the presence of the Holy of Holies.

VOL. III.

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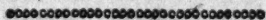
SEPTEMBER II.

THE BEAUTY AND VARIETY OF THE
BUTTERFLIES.

LET us reflect on those beautiful creatures before they are gone. Perhaps, our observations will interest both the heart and mind. The first circumstance that gains our attention, is the clothing with which they are adorned. Some of them, however, have nothing striking in this respect; their dress is plain and simple. Others have a few ornaments on their wings: But some have a profusion, and are all over covered with them. Let us dwell a few moments on this last sort of butterfly. How beautifully the shades variegate! How pretty the spots, which set off the other part of their dress! With what delicacy has nature penciled them! But, however great our admiration in seeing this insect with the naked eye, how much does it still increase, when we examine the beautiful object through a microscope? Would any one ever have imagined, that the wings of butterflies were covered with feathers? and yet nothing is more certain. What is commonly called meal, is found in reality to be feathers. There is as much symmetry in their construction and form, as there is beauty in their colours: The parts which make the centre of these little feathers, and are next to the wing, are the strongest: Those, on the contrary, which form the exterior circumference are much more delicate, and most wonderfully

fine. All these feathers have quills at bottom, but the upper part of them is more transparent than the quills. If the wing is touched roughly, the most delicate part of the feathers is destroyed by it; but, if all that we call meal should be rubbed off, there would only remain a fine transparent skin, in which we might distinguish the little cells or hollows, wherein were stuck the quill of each feather. This skin, from the manner in which it is composed, may be distinguished from the rest of the wing, nearly as we distinguish a fine lace from the linen on which it was sewed; it is more porous, more delicate, and seems as if embroidered with a needle. Lastly, it is edged with a fringe, the most regular, and most exquisitely fine. What are our most elegant dresses, in comparison with that which nature has given to this insect? Our finest laces are a coarse cloth, compared to the delicate texture of the butterfly's wing; and our finest thread would be as a rope. Such is the extreme difference we observe between art and nature, when seen through a microscope. The former, even the prettiest in their kind, are never complete, and appear coarsely worked: The latter are as complete and perfect as can be imagined. How very delicate does a fine cambric appear to us! Nothing more delicate than the threads, nothing more regular than the weaving; and yet, through the microscope, those fine threads are like pack-thread, and we should rather suppose they were interwoven by a basket-maker than come from

the loom of a good weaver. What is most astonishing, this beautiful insect proceeds from the poorest, meanest-looking worm. Observe how the butterfly displays its golden wings and plays in the sun-beams; how it rejoices in its existence, and flutters from flower to flower. Its brilliant wings paint to us the magnificence of the rainbow. How beautiful it is at present! How much it has changed, since the time, when, in the form of a reptile, it crawled in the dust, always in danger of being crushed! Who then has raised it above the earth? Who has given it the faculty of living in the air? Who has bestowed upon it those painted wings? It was his Author and our's. He has shewn us in this extraordinary insect the emblem of the transformation which awaits us. A day will come, when, quitting our present form, we shall cease to crawl upon the earth. Being made perfect, and having nothing to set bounds to our flight, we shall then soar above the clouds, even beyond the stars themselves.



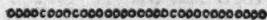
SEPTEMBER III.

THE GROWTH OF TREES.

EVERY tree, however rich its foliage may be, receives its chief nourishment from the bottom or root. We have reason to believe that there is a circulation of juices in it, like that of the blood in animals. The exterior parts of the

root are a prodigious heap of spongy fibres and bubbles of air, but are always open, in order to be filled with the juice they receive from the earth. This juice is at first nothing but water, loaded with earthly matter; then, by means of a sort of milky substance, which is peculiar to each tree, and distinguishes it from any other, this juice acquires a nutritive quality, before it rises to the parts of the tree which are above ground. It is found, by the microscope, that wood, notwithstanding its hardness, is nothing but a collection of an infinite number of little hollow fibres. Most of them, particularly those in shrubs, rise perpendicularly; but, in order to give more consistency to these fibres, there are in certain trees (especially those that are designed to be strong and hard) stalks which go horizontally from the circumference to the centre. Drawn by the heat of the sun, the juice gradually rises into the branches and into their extremities, just as the blood which flows out of the heart is conveyed through the arteries to the extremities of the animal body. When the juice has reached every where that was necessary, what remains of it rises through large vessels, which lie between the inner and outer bark, in the same manner as the blood returns back through the veins. From this results a growth which renews every year, and it is this which causes the tree to grow thick. To be convinced of it, we need only cut a branch across to know the age of the tree. Whilst the stem grows higher and

higher, the root at bottom increases in proportion. As for the outer bark, it seems intended to serve in some measure as a sort of coat for the tree, to unite also closely the part it is composed of, and to guard the tender, though essential parts from accidents, and from the intemperature of the air. It is thus that the wise Creator has formed an admirable system of solids and fluids, in order to give life and growth to the trees which adorn the country, which give shade to our flocks, our shepherds, and hamlets, and which, when cut down, serve so many purposes useful to mankind. Here we discover a wisdom which is never mistaken, which prescribes to nature laws in some respects immutable; and which act without interruption under the eye of Providence. A wisdom so profound, an art so wonderful, so many preparatives and combinations for each tree, ought to lead us to revere and admire more and more the creative hand. The contemplation of such wisdom is a noble study, and animates us to glorify God, so great in his counsels and plans, and so wonderful in the execution of them.



SEPTEMBER IV.

THE FORMICA LEO, or LION ANT.

NO insect is more famous for its dexterity than the *formica leo*, although its form promises nothing extraordinary. It is something like the

woodlouse. It has six feet, and its body (which is composed of several membranous rings) terminates in a point. Its flat square head is armed with two moving hooked horns, the singular construction of which shews how admirable nature is, even in its smallest works. This insect is the most cunning and dangerous enemy the ant has. The plans he forms to catch his prey are most ingenious. He undermines a piece of ground, in the shape of a funnel, in order to stay at the bottom of it, and draw down any ants which may chance to come to the brink of this precipice. The method of digging it is, first, to trace a circular ridge in the sand, exactly the size of the funnel, the diameter of which is always equal to the depth he chooses to make it: when he has fixed on the size of this opening, and traced the first ridge, he immediately digs a second, concentric to the other, in order to throw out all the sand inclosed in the first circle: He performs all this with his head, which is like a shovel; the flat and square shape makes it fit for the purpose. He also takes up sand with one of his forefeet, and throws it over the first ridge, and this he repeats till he has got to a certain depth in the sand. Sometimes in digging he meets grains of sand rather large, or little bits of dry earth, which he cannot bear in his funnel, and gets rid of it by a quick well-measured motion of his head. If he finds still larger pieces, he endeavours to put them away with his back; and he is so earnest in his labour, that he repeats it six or seven

times. At last he gains the fruit of his trouble. His traps once laid, he is on the watch. Quite still and concealed at the bottom of the hole which he has dug, he there waits for the prey which he could not pursue. If an ant comes to the brink of the precipice, it seldom fails of falling into the bottom, because the edge goes sloping, and the loose sand, which gives way under his feet, draws down the insect into the power of the enemy, who drags him with his horns under the sand, sucks the blood, and feasts upon it. When there remains nothing but the dry carcase, he throws it out of the hole; and if the bank is hurt at the top, he puts it in order again, and lies in ambush as before. He does not always succeed in catching his prey the moment it falls. It often escapes, and endeavours to run up again to the top, but then the *Formica Leo* works with his head, and throws up a shower of sand higher than the ant, which drives it down again into the hole. All the actions of this little animal contain such wonderful art, as we can scarce tire of examining. He prepares the holes, even before he sees the insect destined to become his food, and yet his actions are so regulated, that they prove the surest means of providing for his subsistence. How could such an inactive creature as this catch his prey so well as by digging in loose sand, and giving it a sloping form to the hole he makes, and then covering with a shower of sand the insect which falls into it? All his actions have fixed principles

by which he is directed. His ditch ought to be dug in the sand, or it would not be adapted for attracting his prey. According to the make of his body he is obliged to work backwards, and to make use of his horns as tongs to throw up the sand to the edge of the funnel.

The instinct which directs this insect, discovers to us a first cause, whose foresight knew and ordained all that was necessary for the preservation and welfare of this animal. The dexterity it shews is not the effect of experience or practice: it is born with it. We must, therefore, seek its source in that great Being who proportions the instinct of animals to the degrees they require. These reflections lead us to the Creator of all things, the Source of life, who loves to spread it every where, and has formed even this insect so as to make its existence a blessing; and by its instinct (however limited it is in some respects) endows it with an ingenuity approaching to, and in some measure surpassing, reason. His design in this has evidently been to furnish us with opportunities of knowing him; consequently every insect, however insignificant, ought to raise our thought to God who has created the worm as well as the elephant, and extendeth his cares equally to both.

SEPTEMBER V.

CONFORMITY BETWEEN PLANTS AND
ANIMALS.

IT is more difficult than we think, to distinguish and decide what difference there is between plants and animals. It is by imperceptible degrees that nature descends from the latter to the former, and it would require the penetration of an archangel to distinguish the degrees exactly. But what we may perceive is, that with all the differences found between these two sorts of organised bodies there still remains much resemblance.

—The seed is to the plant what the egg is to the animal. From the former springs a stalk which had been concealed under the coats of the seed; and this stalk makes an effort to rise out of the ground. The animal likewise inclosed in the egg, pierces the shell in order to breathe the open air. The eye or the bud of the tree is, in the vegetable kingdom, what the embryo is to the animal. The eye does not pierce through the bark till it has come to a certain size, and it remains fastened to it, in order to receive nourishment from it, as well as from the fibres of the plant. The embryo at the end of a certain time comes from the womb into life; but even then it could not long subsist if it was not nourished by its mother. The plant feeds on nutritive juices, which are brought to it from without, and which

passing through different channels, at last change into its own substance. The animal's food has the same course and progress. Plants are multiplied not only by seed, and by ingrafting, but also by slips. It is the same with animals: They multiply not only by laying eggs, or by bringing their young alive into the world, but also by slips, as we observe in the polypus. The disorders or maladies of plants have either external or internal causes, as is the case with animals. Lastly, Death is the common lot of both, when old age, having dried up and obstructed the vessels, stops the circulation of the juices. The plants and animals inhabit the same places. The surface of the earth and under it, the air, the sea, and the rivers are full of animals and plants. They are both extremely numerous, though the animals are more in number than the plants. The size of the largest tree is very near equal to that of the largest animal. Thus one might be tempted to believe, that animals and plants are beings of the same class, since nature appears to pass from one to the other by imperceptible degrees. It is very certain that some general and essential resemblances have been found between them, and that no difference really essential has yet been discovered. And though some should be found out which have not yet been observed, it is still certain that nature varies her works by such nice shades that the human understanding has a difficulty in discerning them. Who knows what discoveries may be reserved for our posterity? Per-

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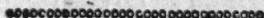
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haps plants may hereafter be known with properties still more like those of the animal bodies; and perhaps animals may be found out still nearer the class of vegetables than the polypus.

Let us make the use of these discoveries for which all the truths of nature and revelation are designed. Let the great resemblance between plants and animals make us sensible of the power and wisdom of that Being, who has in some measure impressed a character of infinity on all creatures. But thou, O man! learn also to be humble. Thou partakest both of the nature of a plant and animal. How wonderful is that creature, who, like the brute, draws his nourishment from the earth, and yet raises his thoughts to heaven as the angel does. A creature, one half of whom perishes like the brute, while the other half lives and is immortal; ordained to become holy and perfect; to be free, and yet subject to God.



SEPTEMBER VI.

THE NATURE AND PROPERTIES OF SOUND.

ALL sounds are produced by means of the air; but it is necessary for that purpose, that the air should be in motion. It is not that every movement of the air occasions a sound, for if this was the case, all wind must be attended by a noise. In order to form a sound, the air must

be suddenly compressed; and must dilate and extend again by its elastic power. This occasions a kind of trembling undulation, something like that of the waves and circles occasioned by throwing a stone into the water. But if this undulating motion was only to be effected by the particles of air being compressed, the sound would never reach our ears. It is necessary that the sonorous bodies, after making impression on the contiguous air, should continue that impression from particle to particle circularly all about us. By this means the particles of air reach our ear, and we have a perception of sound. This progress is made with prodigious swiftness. Sound goes a thousand feet in a second of time, and consequently a German league in twenty seconds. This calculation, which has been proved by many experiments, may be useful in several cases: It contributes to our security, as it tells us what distance thunder is from us; and of course warns us whether we are or are not safe when we hear it roar. We need only count the seconds, or the beating of each pulse between the flash and the thunder, and we may know exactly the distance we are from them. By the same means we may calculate the distance of ships, &c. But it is very remarkable, that a weak sound propagates as quick as a loud one. The motion of the air, however, is stronger when the sound is stronger, because a greater mass of air is put in motion. The sound then is loud when many particles of air are put in motion, and the contra-

ry when there are but few. What use would these philosophical observations be to us, if our bodies were not so formed as to make us capable of perceiving sounds? Let us therefore bless God, not only for having disposed the air in such a manner as to produce sound by its vibration, but for giving us organs also capable of receiving sonorous impressions. A thin elastic membrane, stretched at the bottom of the ear, like a drum, receives the vibration of the air; and by that means we have the power of distinguishing all sorts of sounds. Thus far our knowledge reaches. But if we enquire how it is, that when we pronounce a word, it creates in us the idea, of a *word*, and not a mere sound, or how a tone can act upon our souls; and produce so many different sensations, we are obliged to acknowledge our ignorance of all this. It is enough for us to be convinced by this, as by every thing else, of the wisdom and goodness of our Creator. If there were no sounds all mankind would be dumb, and we should be as ignorant as a child before it can speak; but by means of sounds, every creature can express its wants and its enjoyments. Man has, in this respect, great advantages: he can express the sentiments of his heart; and even excite the passions by certain tones of his voice. God has not only endowed us with the faculty of distinguishing sounds by the organ of hearing, but he has also furnished us with other means of preserving this blessing: if one ear should be hurt the other still may do its office; and a man,

nomena, the near causes of which are unknown to us; several are doubtful; and there are very few which we can be certain of. We hear the wind whistle; we experience its great and its different effects; but we know not exactly what produces it, what increases its violence, or what abates it. From a little grain, we behold grass spring up, stalks and ears of corn; but we are ignorant how it is done. We still less comprehend, how from a little fruit-stone, there can grow a plant, and then a great tree, under whose shade the birds make their nests; which tree is covered with leaves and blossoms, to shade us, and afford us fruit to eat, and wood for our use and convenience. All the food we take of such different nature, transforms within us by an incomprehensible mechanism, and mixes with our blood and flesh. We behold the wonderful effects of the loadstone, and we believe there must be a certain matter which operates in it; but whether it acts by an attractive force peculiar to itself, or whether it circulates continually round the loadstone, and forms a sort of vortex, is what we cannot decide. We feel the cold, but no natural philosopher has yet discovered what occasions it. We are better informed than our ancestors were in respect to thunder; but of what nature is that electrical matter which shews itself so terrible in forms? We know that the eye observes the images painted on the retina; and that the ear has a perception of the vibration of the air; but whence is the having perceptions, and how is it

caused? We are conscious of the existence of a soul in our body; but who can explain the union of soul or body, or their mutual influence on each other. The effects of fire and air are continually before us; but what is really their nature, and what are their integral parts, and how do all their different effects take place? In a word, in respect to most things we have no certain principles, we are reduced to conjecture and probabilities. What are all the hypothesis of philosophers, but tacit confessions of the limits of our knowledge? Nature at every step presents us wonders which confound us; and whatever researches, whatever discoveries we have made, there still remains a thousand things we cannot comprehend. It is true, we sometimes are able to give happy explanations of certain phænomena, but the principles, the first springs, their nature and manner of operating, are certainly above the sphere of our understanding.

The mysteries of nature afford us daily lessons of wisdom, in regard to the mysteries of religion. In nature, God has placed within our reach the means of passing our temporal lives happily, although he has concealed the causes from our sight. Thus, in the kingdom of grace, he furnishes us with means of arriving at a spiritual and everlasting life, though the manner in which they operate remains concealed from us. Would any one refuse to eat and drink, till he knows how it is that food gives him strength, and preserves his life? Or would he neither sow nor plant for want

of having a just idea of the manner in which vegetation operates? Or would he refuse to make use of sheep's wool, till he knew how it was produced? Man does not push his extravagance so far: On the contrary, he observes the productions of nature; experience proves their utility; and he enjoys them with gratitude to his Creator. But why do not men act as wisely in regard to the mysteries of religion? They dispute about the means of salvation; on their efficacy; on their manner of operating; and they forget to make the salutary use of them for which they were intended. O that we were as wise in the spiritual as we are in temporal things! Instead of giving ourselves up to vain and useless speculations, let us take advantage of the means of grace which God has given us, and let us faithfully use them. It is for this purpose that they were granted to us, and not that we should search curiously into their nature and manner of operating. If we find things which we cannot comprehend or thoroughly know, let us receive them with humility, and acknowledge the weakness of our understandings. The advantage they are to us when we make a good use of them, convinces us they are the work of a Being infinitely wise and beneficent; and this is sufficient for us to know. God forbid we should be presumptuous enough to flatter ourselves with a thorough knowledge of the mysteries of nature and of religion; or rash enough to dare to criticise and blame them. Let us rather acknowledge the weakness

of our understandings, and the infinite greatness of God. Thus, each mystery will lead us to adore that almighty Being, whose works are so wonderful, and so much above our comprehension.

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SEPTEMBER VIII.

THE EYES OF ANIMALS.

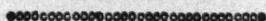
THE reflecting on the eyes of several sorts of animals, is in itself enough to convince us of the wisdom with which God has formed the bodies of his creatures. He has not conveyed the sense of sight to all in the same manner, but he has varied the organs of it, as best adapted to the different sorts of animals. On this subject our reflections may afford us one of the noblest pleasures the human mind is capable of. Most animals have this in common, that they appear round: but in this round form, there is still a great difference. Their situation in the head, where they are near the brain, which is the most sensible part of the body, is liable to great differences. Mankind, and most of the quadrupeds, have six muscles to each eye, in order to move it on both sides. The position of the eye is such, that they may look straight before them, and describe almost a demicircle. But here already we find a difference. Horses, cows, sheep, hogs, and most quadrupeds, have also a seventh muscle to suspend and support the eye-ball; which is necessary to them, because their head and eyes hang down and in-

cline towards the ground to seek their food. The eyes of frogs differ from our's. They can cover their's with a membrane, which is transparent, though of a close texture. This defends their eyes, and guards them from the dangers to which their way of life exposes them; sometimes living in water, and sometimes on land. Flies, gnats, and other such insects, enjoy more perfect sight than other creatures: they have almost as many eyes as they have holes in their cornea. While other animals which have only two eyes are obliged to turn them, by means of muscles, to every object, the flies can see distinctly on all sides uninterruptedly, and without having the trouble to turn their eyes; because some of these little eyes are naturally and constantly directed to the objects around them. The fish, which live in an element more dense than our's, could not see there, and by the strong refraction of the rays of light they would be blind, though their eyes are open and well formed, if they had not a crystalline almost round, in order to collect the rays better. They have no eyelids, and they cannot draw in their eyes, but their cornea, which is as hard as horn, sufficiently defends them from all danger. They formerly did not allow that the mole had sight; it is however certain that it has two little black eyes, though not larger than the heads of pins. As this animal is generally under ground, it was necessary that his eyes should be very small, sunk in the head, and covered with hair. It is known,

that the eyes of snails are placed at the end of two long horns, and that they have the power to draw them in, or to raise them above their heads to discover objects more distant. In some animals, who can neither move their eyes nor heads, this fault is compensated by a multitude of eyes, or in some other manner. Spiders have from four to six, and sometimes eight eyes, all placed on the front of a round head, with no neck. They are clear and transparent, as a bracelet set in diamonds. According to the way of life, and the different wants of some sorts of spiders, these eyes are differently placed; so that without moving their heads, they may on all sides see the flies, on which they feast. The cameleon (a sort of lizzard) has the singular property of moving one of his eyes while the other remains still; of turning one up to the sky, and looking on the ground with the other; and of seeing what passes before and behind him at the same time. The same power is observed in some birds, in hares, and in rabbits, whose eyes are convex, which saves them from many dangers, and enables them to find out their food more easily.

All these examples, to which millions might be added, mark visibly the care of the Creator for the preservation of the most necessary organs of the senses. He has pleased to convey the happy impression of light to his creatures in different ways: and we cannot but be struck with astonishment, when we reflect on the admirable art observed throughout, and the precautions which

have been taken to maintain creatures in possession of this precious organ, and to guard it from the dangers to which it might be exposed. Every part of the bodies of animals is disposed in the most exact proportion, and the best adapted to their different designs. It was not only for ornament, but for the benefit of animals, that the Creator so varied the construction and position of their eyes. And, undoubtedly, one of his views in this was to teach us to acknowledge and praise his wisdom in all things.



SEPTEMBER IX.

FISH.

WHO that had never seen fish would have believed there were such creatures? If a naturalist only knew animals that walk and breathe on land, as the rein-deer does, and was told that there were creatures in the water, so formed as to live, move, multiply, and fulfil every animal function in that element with ease and pleasure, would he not treat it as a fiction, and conclude, from the effect on our bodies, when plunged in water, that it is absolutely impossible to live in that situation. It is certain, that the way in which fish live, their construction, motions, &c. are quite wonderful, and afford fresh proofs of the omnipotence and infinite wisdom of our sovereign Creator. To enable these creatures to live in water, it was necessary to form their bodies, in

essential points, very different from those of land animals; and we accordingly find this the case in fish, both within and without. Why has the Creator given to most fish a slender thin body, flattened at the sides, and always a little pointed at the head, if it was not that they should swim, and cut their way better in the water? Why are they covered with scales of a horny substance, if it is not to preserve their bodies from being hurt by the pressure of the water? Why are several sorts of fish (particularly those without scales) enveloped with a fat and oily substance, if it is not to preserve them from putrefaction, and to guard them from cold? Why are the fish bones so different from other bones; if it was not to make their bodies more flexible and light? Why are the eyes of fish sunk into the head, and why is the crystalline round, if it is not to guard them better from being hurt, and to make them take in more light? It is evident, that, in the formation of all those parts, the Creator has considered the way of life, and destination of these animals. But there are still more wonderful circumstances in their construction. The fins are almost their only limbs, and yet are sufficient to perform all their motions. By means of the tail-fins, they move forward; the back fin directs the motion of the body; they raise themselves up by the breast-fin, and that of the belly serves to balance them. The gills are the organs of respiration. These are behind their head. There are four on each side, the uppermost of which are the lar-

gest. They are continually swallowing water through their mouths, which is their drawing in of breath, and they cast it out through their gills, which is their way of breathing out again. The blood which comes from the heart, and flows into the veins of the gills, does not return back to the heart through the lungs, as in land animals, but it is directly dispersed throughout all parts of the body. One of the organs most necessary to fish in swimming, is the bladder of air in their belly, which communicates with the stomach. By means of this bladder they make their body more or less heavy. When this vein swells and extends, they become lighter, can raise themselves, and swim to the surface of the water. When it contracts, and the air is thereby compressed, the body becomes heavier than the water, and consequently sinks down. Thus, if this bladder is pricked with a pin, the fish sinks at once to the bottom, and can no longer keep at the top of the water, and is still less able to raise itself up to it. The prodigious quantity of fish, with the great variety of shape and size, is worthy admiration. In Germany alone there are above four hundred species of fish, and who can count the numbers there are of each species? Their outward form is also greatly varied. The very largest, as well as the smallest of animals, are to be found amongst fish. Some are long, and small as a thread; others short and broad. Some are flat, cylindrical, triangular, round, &c. Some are armed with a horn; others with a sort of

sword; and others still with a kind of saw. Some have nostrils, through which they eject the superfluity of water they have swallowed. Which then ought we most to admire in all this, the power and wisdom of the Creator, in the forming and preserving of these animals, or his goodness in giving them for our use? The whole must lead every attentive observer of the works of God to magnify his name. What greatness appears in all the elements, in all the animals, whether they inhabit the air, the earth, or the sea? in the whale, whose back is like an island in the midst of the sea; in the gold fish, which glitters in the stream?

S E P T E M B E R X.

THE MOTIONS WHICH BELONG TO THE
HUMAN BODY AND MIND.

TH E R E are three sorts of motions, which every one may observe in themselves who turn their thoughts to such things. *First*, Those that tend to the preservation of the human frame, such as the motion of the heart, the circulation of the blood, the action of the stomach in digestion, the work of the bowels, &c. nourishment and growth. Of the action of these vital parts every one is wholly ignorant; not the least consciousness can be pretended of how we live;

only when the machine is in any way disordered, there is generally some notice given by pain or uneasiness.—The *second* sort of motions are those which we seem, as free agents, to have the command of, but over the *performance* of which we are conscious we have no power or direction. Such are all external motions, walking, speaking, handling. Here the action follows our wish or will; but it is not *we* that direct the muscles, joints, &c. we are most of us wholly ignorant how the action is performed. Of this we have a remarkable instance in taking aim at any thing, for the hand, at the command of what is called the *will*, does precisely for the most part follow the direction of the eye, and strikes the part intended, though we know not how. And even those actions, which seem at *first* to be directed by the will, may at *last* be performed by a mechanical habit; so that a whole band of music may be brought to *play* on different instruments, without attending to the notes; and a vast variety of motions may be regularly performed, but not by the power, nor even by the direction of the performers. The *last* sort of motions are those which our affections and passions excite; for *these* are as really *felt* by the body, as pain externally applied; and they express themselves likewise on the body by outward signs. But over these again, that thing called *me* has no power to excite them; but certainly seems at least to have that of chusing or refusing, of concealing or repressing them in some degree; and there is in *me* a consciousness

at least of their *existence*, as well as of my power to perform the former motions whenever the machine is in a state to act. If any one will still say that 'the whole is a machanism, and that matter may think,' it is not in my power to convince him. I allow there is something mechanical, some connection with the body in every operation of the mind; but still there is besides a *something* that I must call *me*, which receives the impressions of the senses; which distinguishes pleasure from pain; which chuses the one, and rejects the other; which is *conscious*, in short, of its own existence, and conscious also that it exists not of itself. This, however, though it be, I suppose, in every man, is not attended to by all; nay, probably would not have been attended to by any, if divine revelation had not taught man to think. The great argument of the materialist is, that he who is supposed to act with freedom of will, is supposed to act without a motive; but this I beg leave to deny. There is a motive in every man, viz. the desire of happiness, and consequently of existence. I cannot see any right we have to think that the Almighty cannot give every one power to chuse, as to the means of happiness, whether to seek it in present enjoyments, or in future hopes; in living in obedience to divine Wisdom, or in the gratification of gross appetites. In the first kind of motions before mentioned, I see a proof of great goodness in the supreme Being, in not having left my preservation to myself. In the second, I feel the power, and see the wisdom and

goodness of God, in making me sensible of a continual dependence on him ; and in his performing by me such things as I could not do without a degree of knowledge, and a multiplicity of attentions, which would make me a very *different*, and I suppose a less *happy* being than I now am. As to the last, (the motions our passions excite,) it seems to me evident, that it is more worthy of the divine Wisdom to be served by moral agents, than by those whom necessity directs; and I therefore believe we have a power to regulate our passions, and check, in some degree, this third kind of motion. I think then I see a reason for the three distinct sorts, which every one must be conscious do exist in fact, allowing a freedom of will. But if the whole is guided by necessity, I cannot see any reason for these different appearances, especially for the fallacy, which must be naturally imposed upon the greatest part of mankind, and that without any advantage to be obtained by it: I mean the idea of being free agents, which seems to force itself upon us. I think there is still another thing worth observing, as to the motions that concern preservation, which is the uneasy sensations that attend the least disorder in that first set of motions. For these sensations seem to call for help: But to whom do they call, if not to that same *me*, *i. e.* the human *soul*? If any thing happens to the exterior parts of the body, the second sort of motions immediately afford relief. The eye-lids shut mechanically; the hand moves to a part that is hurt; the body

springs when in danger of falling ; but a palpitation of the heart, a pain in the stomach, finds no mechanical relief. It calls upon the understanding and will to provide a remedy, and therefore necessarily points out the existence of such faculties, and a being in whom they exist : but if no such being does exist, and all is mechanical, how can we account for the divine wisdom, in providing two different ways of acting on that same thinking machine, were one would have been sufficient ?

S E P T E M B E R X I.

INFLUENCE OF THE MOON ON THE
HUMAN BODY.

FORMERLY there were imputed to the moon certain influences upon the body, which were only calculated to raise superstition and groundless fears. The gardener would not plant till he had consulted the moon. The ploughman deferred sowing till he was certain of its happy influence. Sick people attended, with superstitious exactness, to the changes of the moon ; and the physicians themselves observed it in their prescriptions. By degrees these prejudices have been removed, or are, at least, less universal than they were. This is one of the advantages the present age has over the former ; An advantage we are not so sensible of as we ought, and for which we should bless

God. It is our duty to make it still more universal, and to endeavour to banish as much as we can the old superstitions.—In regard to the influence of the moon on our bodies, the safest way is to preserve a medium: For, as it would be irrational to attribute to that planet too great a power over the human body, so it would be no less rash to deny it any effect. It must in reality be allowed, that the moon occasions great changes in the air, and of course, may produce some in our bodies. The moon causes such considerable alteration and motion in the higher atmosphere, that earthquakes, winds, heat, cold, vapours, and fogs, result from thence; and, in that case, the health of our body will, in a great measure, depend on the influence of the moon. It is observed in persons that have certain infirmities, that they relapse, and suffer more at the time of new and full moon. This is not surprising; for if it be true, that cold, damp, cloudy, and stormy weather has a different effect upon our health, from a warm, dry, pure, and a serene air, the moon may well have an influence on the animal frame, since it produces so many changes in the temperature of the atmosphere. The power this planet has over the human body is founded on an undeniable principle, which is, that our health greatly depends on the weather, and the sort of air we breathe; and it is certain that the moon causes many alterations in the atmosphere. Perhaps there may even be a flux

and reflux in the human body, occasioned by the moon; like that in the air and sea.

Why do most periodical diseases return at the end of four weeks, rather than at a longer or shorter period, if it is not owing to the effect of the moon upon the human body?—In general, it is a principle we ought to admit, to the glory of our wise Creator, that throughout all natural things there are certain connections, which influence in different ways the animal œconomy. There are without doubt many wonders in the atmosphere still remaining unknown to us, which cause many considerable revolutions in nature. Who knows if some of the phenomena of the corporeal world, which we do not think of, or which we attribute to other causes, may not depend on the moon? Perhaps the light it affords us in the night is one of the least of the purposes for which God formed this planet. Perhaps its being so near our earth was to produce certain effects on us, which the other celestial bodies, from their distance could not do. It is at least certain that every thing in the universe has relation more or less remote with our globe. And this is precisely what renders the world a masterpiece of divine wisdom. The beauty of the universe consists in the variety and harmony of the parts which compose it, in the number, nature, and variety of their effects, and in the sum of happiness resulting from all these combinations. How then can the influence of the moon or stars create superstitious fears in our minds? If we believe that it is God who has

planned every thing, and who has fixed the connection between all these globes, how can we encourage vain terrors so contrary to the idea we ought to form of divine wisdom? If we are really persuaded, that this great Being governs all things with infinite wisdom and goodness; is it not natural to trust to him, and to rest with joy and tranquillity upon his good providence?

SEPTEMBER XII.

THE IGNIS FATUUS.

THE Ignis Fatuus are little light flames which play in the air only a few feet from the ground, and appear to go here and there and every where. These fires seem sometimes to disappear and go out all at once, probably when bushes or trees conceal their light, but they kindle again immediately in other places. They are not common in cold countries; and it is said that in winter they chiefly appear in marshy places. In Spain, Italy, and other hot countries, they are known at all seasons, and neither rain nor wind extinguishes them. They are frequently seen where there are putrid plants, or animal matter, as in church-yards, shores, rich and marshy ground. There have been too few experiments made on these sort of ethereal fires to determine precisely as to the nature of them. But the places where they are generally seen may give rise to probable conjectures; for as they scarcely ever appear but in marshy countries, it is natural

to suppose them sulphureous vapours which take fire. It is known, that carcases and rotten plants sometimes cast out light. Perhaps vapours condensed by the cold of the night take the appearance of the Ignis Fatuus. Perhaps it may be the effect of a slight electricity produced by the interior motion of the vapours which rise in the air. Horses, dogs, cats, and even men, may become so electrical as to cast out sparks of fire, when they are rubbed, or otherwise put in motion. May not this be the case with some parts of the earth? It may so happen, that, in some circumstances, a field shall be electrified in some parts of it, and then it is not surprising that it should appear luminous. Even the air may occasion the Ignis Fatuus, when it is electrified to a certain degree. If the manner of their being produced is still doubtful, we are certain, at least, that they proceed from natural causes, and, consequently, are not obliged to have recourse to superstition. Superstitious people look on these flames with such terror, that few of them have courage to go near them. They think they are the souls of the dead, or wicked spirits wandering here and there, who take pleasure in leading travellers astray in the night time. What may have given rise to this superstitious idea, is the observing that the Ignis Fatuus follows all the ways of the wind, and thus flies from those who pursue it; and, on the contrary, follows those who try to avoid it, and fixes on carriages which go swiftly. But the reason of this phenomenon is very evident: For the person who pursues this flame

drives the air, and consequently the fire before him; whereas the person who flies, leaves an empty space, which the ambient air fills up continually. This produces a current of air between him and the fire, and of course draws it after him. This is the reason we observe it to stop when the person ceases to run. How much we torment ourselves by vain terrors, which have no foundation but a disordered fancy. We might spare ourselves many fears, if we would take the trouble to examine the objects which frighten us, and seek for their natural causes:—The same thing happens to us in respect to moral things. With what ardour we pursue the goods of fortune, without examining if they are worth such anxiety, or can procure us the hoped for happiness. Most ambitious and covetous people are as unsuccessful in the pursuit of honours and riches, as Robert Flood was, who ran after the Ignis Fatuus, without being able to catch it. What do we gain in the end by our continual endeavours to obtain riches, which in their nature and duration are so like the Ignis Fatuus: Earthly treasures generally escape those that pursue them, and fall to the lot of those who seem to fly from them.

SEPTEMBER XIII.

ON MINERALS.

IN order to provide mankind wholesome and convenient dwellings they required many mate-

rials. If these materials had been spread over the surface of the earth, it would have been entirely covered with them, and there would not have been room for the animals and plants. Our earth is happily free from such incumbrance. The ground is left free to be cultivated and enjoyed by its inhabitants without any hinderance. Metals, stones, and an hundred other things we continually make use of, are shut up in vast magazines under our feet, where we may have them when we want them. They are not concealed in the heart of the earth, nor so deep as to render them inaccessible to us, but are purposely brought near the surface, and placed under a vault, which is both thick enough to furnish our food, and thin enough to be dug through when necessary to take out some of the numberless provisions contained in it for the use of mankind.

Minerals may properly be divided into four classes of very distinct characters. The first includes *fossils*. We give that name to minerals which cannot be dissolved either in water or oil, and are not malleable, and which bear the fire without losing any substance in it. To this class belong not only the simple earths, but the stones also which are composed of them. There are two sorts of stones, the precious and the common stones. The latter are very numerous, and present us masses different in form, size, colour, and hardness, according to the earth, sulphur, &c. of which they are composed. Precious stones also differ very much. Some are perfectly transparent,

and appear to be the most simple. Others are more or less opaque, according as they are composed more or less of heterogeneous particles.—The *Salts* form the second class of minerals. It comprehends bodies which water dissolves, and which produce a relish. Some grow liquid by fire: others are unalterable. They are divided into Acids, which are sharp and sour, and into Alkaline, which leaves an acrid, burnt, lixivious taste on the tongue. These have the property of changing into green the blue juice or dyes of vegetables. From the just and exact mixture of these two different salts, tempered by each other, proceeds the neutral or middling salts, such as the common kitchen salt, which is either taken out of earth, or prepared with sea-water, or obtained by the evaporation of salt water boiled in great chaldrons. All these salts together are one of the chief causes of the vegetation of plants. They possibly serve also to unite and fix them, as well as all the other compound bodies. Lastly, they occasion fermentation, the effects of which is so numerous and so different. The third class of minerals comprehend inflammable bodies, to which are given the name of *Bitumens*. They burn in the fire, and when they are pure they dissolve in oil, but never in water. They are distinguished from other minerals by the inflammable substance they contain more of than any other, and which renders combustible the bodies they mix with, if in sufficient quantity. There is more or less of this in all bodies.—The fourth class of minerals is the *Me-*

tals. They are much heavier than the rest. They become fluid in the fire, but they resume their solid state when cold. They are bright, and are capable of being distended under the hammer. There are some metals, which though melted in the fire, do not diminish in weight, or under go any other sensible alteration. This gives them the name of *perfect metals*. There are two of this order, viz. gold and silver. The metals called *imperfect* are reduced more or less quickly by fire, and generally change into lime. One of these (iron) has the property of changing into glass, and of vitrifying also all other metals, except gold and silver. There are five of the imperfect metals, quicksilver, lead, copper, iron, and pewter—Lastly, there are bodies which differ from these metals by not being malleable. They are called half metals, and there are seven of them; the platen, bismuth, nickel, arsenick, antimony, zink, and cobalt.

The mineral kingdom is the great warehouse of nature, where she secretly labours for the good of the world. No naturalist can surprise her in her operations, and steal from her the art with which she prepares, collects, and composes earths or fossils, salts, bitumens, and metals. If we cannot guess how nature employs the matter which she every day produces, it is no less difficult to discover how the parts mix, combine, attenuate, and, in the end, form the different bodies which minerals present to us. We have but an imperfect knowledge of the earth, and we are still less ac-

quainted with the inside of it. The deepest mines are not lower than 630 fathom, which is not the fix millioneth part of the earth's diameter. This alone may convince us how impossible it is to have an exact and general knowledge of nature, and of the formation of many things amongst minerals. Happily, in the use we make of nature's gifts, it is of little consequence that we should know their origin and first principles. It is enough that we should understand their use. We want no more to prove the glory of the Creator, as we are convinced that there is not a spot either above or below the earth, in which he has not shown his power, wisdom, and goodness.

SEPTEMBER XIV.

SOME OF THE CHIEF EXOTIC PLANTS.

WE do not pay attention enough to the gifts of God, particularly to those which come to us from distant countries, and are now so necessary to us. If we considered how much trouble it costs, and how many wheels must be put in motion, and how much human industry it requires to procure us a single bit of sugar or cinnamon, we should not receive the gifts of nature so coldly as we generally do; but on the contrary, we should look up with the warmest gratitude towards that beneficent Being who makes use of so many means of bestowing blessings upon us. Let us at present dwell on some of the foreign productions which are

become to us necessaries of life ; and which would be so difficult for us to dispense with : Perhaps some good reflections may arise from it ; and that we may think at least with pity on those unhappy slaves, whose indefatigable labour supplies us with so many luxuries—Sugar, properly speaking, is the juice or marrow of a certain reed, which is cultivated chiefly in Brasil and the neighbouring islands ; but which also grows in great abundance in the East Indies, and some of the African islands. The preparation of sugar does not require much art, but is extremely laborious ; and it is generally the employment of slaves. When the canes are ripe, they cut and carry them to the mill to bruise and extract the juice from them. They first boil this juice, which would otherwise ferment and grow sour. While it is boiling they skim it to take off any dirt. They repeat this course four times in different cauldrons. To purify and clarify it the more, they throw into it a strong lye of wood-ashes and burning lime, and lastly, pour it into moulds where it coagulates and dries—Tea is the leaf of a shrub, which grows in Japan, China, and other Asiatic provinces. Three or four times during spring, these leaves are gathered. Those of the first crop are the finest flavoured and the most delicate. This is the imperial tea ; but it never comes into Europe. That which the Dutch sell under that name is tea of the second crop—Coffee is the stone of a fruit like a cherry. The tree which produces it is ori-

ginally from Arabia; but it has been transplanted into several hot countries. Next to Arabia, it is best cultivated in the isle of Martinico. We call the stone in the middle of the fruit the berry. This berry when fresh, is yellowish, or grey, or a pale green; and preserves this colour in some degree when dry. They spread the fruit on mats to dry in the sun; and afterwards bruise it with rollers to force out the berries. This is what divides the berry in two. They again dry them in the sun before they put them on ship-board.—The cloves are buds, or dried blossoms of a tree, which formerly grew without culture in the Molucca islands, but which the Dutch have transplanted to Amboyna. This tree is of the size and shape of the bay-tree: Its trunk is covered with bark like that of the olive. White blossoms grow in tufts at the extremities of the branches, and look like a clove. The buds are at first of a pale green; afterwards they become yellow; then red; and at last a dark brown, such as we see them. They have a stronger and more aromatic smell than the mother clove, a name which marks the dry fruit of the tree.—Cinnamon is the second bark of a kind of bay-tree, which scarce grows any where at present but in the island of Ceylon. The root of the cinnamon tree divides into several branches. It is covered with a bark, white grey without, and red within. The leaf would a good deal resemble the laurel, if it was shorter and less pointed. The blossoms are small and white, of a very pleasing smell,

very like the lily of the valley. When the tree is some years old, the two barks are taken off. The outer bark is good for nothing, and thrown away: the inner one is dried in the sun, where it rolls up of itself about the size of a finger; and this is what we call cinnamon.—The nutmeg and mace come from the same tree, and grow in the Molucca islands. The nut is covered with three coats. The first falls off of itself when it is ripe. The second then appears, which is very thin and delicate. It is taken off with great care from the nut, and exposed to the sun to dry. This is called mace in the Molucca isles; though in other places properly called nutmeg-blossom. The third coat is immediately next the nutmeg. They take the nut out of its shell and put it into lime-water for some days, and then it is properly prepared to send abroad.—Cotton grows in most the countries of Asia, Africa, and America. It is enclosed in the fruit of a certain shrub. This fruit is a sort of pod, which when ripe, opens a little, and shews a wad or flock of down extremely white, which we call cotton. When this pod is swelled by the heat, it becomes as large as an apple. With a little mill they separate the seed from the cotton. The seed falls out on one side, and the cotton on the other. They afterwards spin it for all sort of work.—Olive oil is the juice squeezed out of that fruit, which grows so abundantly in France, Spain, Portugal, and Italy, that there are whole forests of olive trees. The inhabitants of the provinces, where there

are many of these trees, make use of this oil instead of butter ; because they have not much cattle, as the extreme heat dries the grass.—— Pepper is the fruit of a shrub, the stalk of which requires a prop to support it. Its wood is knotty like the vine, which it much resembles. Its leaves, which have a very strong smell, are of an oval form, and terminate in a point. In the middle and at the ends of the branches there are white blossoms, from whence spring fruit in clusters like the gooseberry. Each cluster bears twenty or thirty seeds.

It is no small satisfaction, to a reflecting mind, to observe the profusion of blessings granted to us by divine goodness. Behold how every country contributes to furnish us with them.

SEPTEMBER XV.

REFLECTIONS ON MYSELF.

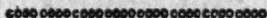
I AM alive ; my blood circulates (without my knowing how) through my veins, which are formed for that purpose with wonderful art. I can enjoy the sweets of sleep ; and in that insensible state, even when this body appears motionless and lifeless, my soul still exists. I awake ; my senses resume their functions, and my soul receives clearer and more lively impressions. I eat, I drink, and, on all sides surrounded with the beauties and treasures of nature, I experience a thousand pleasing sensations. Am I the cause of these effects ? Did I give to the first principles,

the first lineaments of my body, this wonderful motion when I was plunged in nothingness, and knew not what motion was? Did I form the many different parts of my body, I who do not even now know their arrangement and combination? Was I wiser, or had I more knowledge before I existed, or did my existence proceed from my thinking principle? How is it that I cannot determine the period of sleep and waking? What is the mechanism of my stomach, which digests food without my directing, or in any way contributing towards it: and how is this digestion contrived? Why are all creatures of my species formed as I am, and why did I not form myself differently? Did I create all the beauties of nature, or did they also produce themselves? What makes me susceptible of pleasure and pain? Who is it that makes the bread to grow in the ground, and the water to spring up, that my body may not wither away, nor my limbs lose their motion? Who sends rays of light to fall upon my eyes, that I might not be enveloped in eternal darkness? From whence proceed the blessings I experience, and from whence the pain and grief of which I am so sensible? Why do I not enjoy continual health? and why was I so cruel to myself, as to form myself with so many imperfections? Does every thing proceed from me? Have I power and activity enough for that? and are all my fellow creatures endowed with the same faculties? Extravagant and inconsistent thoughts, which betray the perverseness of those

who indulge them. My soul, limited and imperfect as it is, declares the greatness of that Being who formed it. A necessary Being of infinite perfection, on whom I entirely depend. This body which I bear, and the construction of which I am not myself acquainted with, shews, that it must have a wise Maker, whose greatness my weak understanding cannot fathom; and who has formed and placed so admirably all those muscles, nerves, veins, in a word, all the parts of which I am composed. How could a man, who is so weak and limited a being, conceive and execute the original of a machine so composed and so artfully constructed, the parts of which are connected with such harmony, he who is not able even to copy or make an exact representation of it? There is not the smallest particle of our bodies for which there is not a reason; and which is not either absolutely necessary, or at least made such by the connection with the other parts. Experience, as well as reason, proves this beyond a doubt; and certainly the Creator must be infinitely great, since I am not the only being who may glory in having been formed with so much wisdom and with such wonderful art. Millions such as me, innumerable multitudes of animate and inanimate creatures seem to cry out with one voice, Behold the invisible God, acknowledge him in his works; behold his greatness and perfection displayed in all of us. Reflect on the most insignificant of beings: It lives as thou dost; it has received its existence and life as thou hast

done. Blessed be he who has so wonderfully formed us. To thee, O Lord! thou adorable Author of my existence, do I owe eternal praise. It is through thee that I live, move, and have my being. It is through thy goodness that my soul continues to reflect and think in a sound body. It is by thy will that all nature gladdens my heart. It is thou whose power, wisdom, and goodness, I and all intelligent Beings adore. It is thy Providence I bless. Thou knowest all hearts; thou regardest all our actions. Thou dost not desire that we should pass our days in darkness and sorrow; or that we should consider our existence as an evil. - Thou permittest us to enjoy with geatitude] the innocent pleasures of life. When the bird in the air fills me with wonder at the rapidity of his flight, and charms me with his elegant form and sweet notes, is it not just that I should recollect he is thy work, and his songs so many hymns to the Creator? Thou providest for him as well as for me. He feeds on the seeds which thou caufest to grow for him, and the corn which seems to rot on the ground, by thy command becomes the support of my life. Thou sendest sun and rain to make the earth abound in delicious fruit, whilst I with the utmost effort, could not produce a single blade of grass. It is not merely the necessaries of life that thou grantest us, but also what the world calls riches, pleasures, fortune, &c. Thou directest events in such a manner, that even those which appear the most unfortunate, often contribute towards our

happinefs. In a word, after having formed us moft admirably, thou ftill prefervelt us by a continual train of wonders. May the fhort hours of of my pilgrimage on earth (thofe hours that will never return) may they be employed in a manner worthy the defign of my exiftence ; fo that when I quit this world I may enjoy eternal happinefs.



SEPTEMBER XVI.

THE STRENGTH OF THE HUMAN BODY
COMPARED TO THAT OF ANIMALS.

ALTHOUGH the human body is more delicate, externally, than that of moft animals, yet it is very ftrong, and perhaps more fo, in proportion to its fize, than any of their's: For, when we compare the ftrength of a lion to that of a man, we ought to confider that this animal being armed with claws, we are apt to form a falfe idea of his ftrength from the ufe he makes of them. But there is a better method of comparing the ftrength of men and animals. This is by the weight they can bear. If it was poffible to collect into a fingle point altogether the whole ftrength a man makes ufe of each day, it would be found that one of the leaft men would be able to lift a weight of 1,728,000 pounds, a foot from the ground, every day, without hurting his health. In general, people accuftomed to hard labour, can, without much difficulty, carry burdens of 150, and fometimes 200 pounds weight.

The street-porters often carry burdens from 7 to 800 pounds weight. In London, those who ply at the quay to load and unload ships, sometimes carry burdens which would kill a horse. The size of a man's body is, in proportion to that of a horse, as one to six or seven; therefore if the horse was proportionably strong, it could bear from 12 to 1400 weight, which it cannot do by any means. A learned Frenchman made an experiment of the strength of the human body. He had a sort of harness made, by means of which he placed on every part of a man's body standing up, a certain number of weights, so that each part of the body supported as much as it could bear with the other, and there was no part that was not loaded in proportion. This machine enabled the man to carry a weight of 2000 pounds, without his being overloaded. We may also judge of the strength of a man, by the exercise he is able to use for a continuance, and by the lightness of his motions. Men, who are used to running get the start of horses, or at least can bear the exercise longer; and even in walking, a man who has been accustomed to it will go farther in a day than a horse can; and, if he should go no farther, he will be able to continue his journey many days without inconvenience, while the horse will be exhausted with fatigue in a much less time. At Ispahan, the couriers go near thirty German leagues in ten or twelve hours. Travellers assure us, that the Hottentots outrun the lions, and that the American savages, who

hunt the elk, pursue these animals, though they are as fleet as the stag, with such swiftness, that they tire them down and catch them. Many more things are told of the prodigious lightness with which the savages run, and their long journeys on foot, up steep hills, in the roughest ground, where there is no beaten path. These men, we are informed, take journeys of a thousand or twelve hundred leagues in less than six or eight weeks. Is there any animal, except birds, with muscles strong enough to bear fatigue so long? The civilized part of mankind do not know their own strength. They know not what they lose by effeminacy, or how much may be gained by the use of much exercise. There are sometimes men of very extraordinary strength amongst us; but this gift of nature, which would be so valuable, if necessary to be employed in their defence, or in useful labour, is of very little advantage to a polished people, where the mind does more than the body, and where manual labour is left to the lowest order of men.

Here again we may observe the admirable wisdom with which God has formed our bodies, and made them capable of such activity. At the same time I cannot but look with pity on those indolent men, who pass their lives in idleness, sloth, and effeminacy, and who cannot resolve to exercise and make use of their strength, for fear of hurting their health, and endangering their lives. Why has God given us such powers, if it is not to make use of them? Therefore, when

we waste them in effeminate indolence, we refuse to conform to the will and intentions of our Creator, and are guilty of unpardonable ingratitude. Let us then employ our powers in the service of our fellow-creatures, according to the situation in which God has placed us in this world, and, if circumstances require it, let us eat our bread with the sweat of our brows. Shall we not still be happier than many millions, who are exhausted with pain and labour, and groaning under the yoke of unsupportable slavery, who, when worn out, have no means of relief, no rest from their oppression. The more happy we find ourselves in comparison with these miserable people, the more attentive we ought to be to fulfil our duties.

• SEPTEMBER XVII.

THE NATURAL INSTINCT OF THE BUTTERFLY IN THE PRESERVATION OF ITS SPECIES.

AT this season of the year the butterflies all disappear; but the race are not extinct. The insect lives in its posterity; and by a wonderful instinct, has taken care to provide for the preservation of its species. The eggs it has laid will produce new generations: but where will it lodge them at the approach of the winter season? and how will it guard them from the autumnal showers, and from the cold? Are they not in danger of being washed away or frozen? The

beneficent Being who gives wisdom to man, has also vouchsafed to inform the butterfly how to secure in safety the only surviving legacy it leaves to the world, by pasting over its eggs with a gluey substance it draws out of its body. This sort of paste is so close and compact, that the rain cannot penetrate through it, nor can the common cold of the winter kill the young ones contained in those eggs. But it is observable, that though each species always follows the same method from generation to generation, yet there is great variety in the measures which the different species of butterflies take for the preservation of their race.—Naturalists inform us, that some of these insects lay their eggs in the beginning of autumn, and die soon after. The sun, which has still some power, warms the eggs. There come out (even before winter) a number of little caterpillars, which begin to spin directly, and make themselves very spacious nests of their thread, where they pass the cold season of the year without eating, and almost without motion. When this retreat is opened, it appears, that what they spin serves them for bed and covering. It is also remarkable that the butterflies, as well as other insects, constantly lay their eggs on chosen plants fit for their young, such as will afford them the necessary food. Thus, when they are hatched, they find themselves surrounded with proper food, without being obliged to change their place, at a time when they are too weak to go far.

All these things, and many others of the same

nature, are calculated to make us admire the wise plans of a protecting Providence. If any thing but miracles, absolutely out of the course of nature, could affect and excite our attention, the reflecting on the care which these insects take of their young, cares so varied in the different species, and yet so regularly the same in each particular species, would fill us with the greatest astonishment.—Let us, who are rational beings, learn from these little creatures to maintain in our heart the love of posterity, and to interest ourselves effectually in those that are to come after us. Let us not be discouraged in the projects and schemes we form, by the thought that death may overtake us before we have accomplished them. Let us remember what we owe to society, and that we ought to take at least as much interest in what relates to posterity as those who came before us did in what relates to this age. It is particularly the duty of parents to learn from the butterfly to provide for the welfare of the children who survive them; and to place them beforehand in as agreeable and good a situation as they can. They certainly cannot foresee, nor consequently prevent, the wants and misfortunes to which they may be exposed by unforeseen accidents; but at least, they should not be made unhappy through our fault.

SEPTEMBER XVIII.

THE VINE.

WE need only reflect on the vine, to be convinced how unreasonable those are, who complain of the inequalities and unevenness of the ground. The vine never flourishes on a flat; neither does every sort of hill agree with it, but those only which are turned towards the east or south. Hills are in a manner the bulwarks of nature, which she invites us to cultivate as so many vast walls for fruit, where the warm reflection of the sun unites with the fine open air to nourish them. Even the most barren hills, and those hanging grounds where the plough cannot be used, are every year covered with the most beautiful verdure, and produce the most delicious of all fruit. If the soil where the vine grows appears so poor and bad, the plant which furnishes us with wine is little better. Who would have thought on seeing it only, that the worst wood, the most shapeless, brittle, and useless of any, should produce so valuable a liquor? And yet such is the fire with which the vine is animated, that the sap flows through it with five, or even eight times more force, than the blood in the veins of animals.

The evaporation of the vine is also so considerable, that, in order to replace what exhales through the leaves, it is necessary that 152 inches of sap should rise up into the vine in the space

of twelve hours. Who is it that gave to the vine qualities so superior to the meanness of its origin, and to the poverty of its native ground? Who gave it such fire and spirit that it may be preserved for several years, and even grow the stronger? With what wisdom also has God disposed the vineyards over the earth? They do not thrive every where. They require to be situated between 40 and 50 degrees of the latitude, consequently in the middle of the globe. Asia is originally the country of the vine. From thence its cultivation has gradually extended into Europe. The Phenicians who travelled in early days over all the Mediterranean coasts, conveyed it to several islands, and to the continent. It succeeded wonderfully in the islands of the Archipelago, and was afterwards carried into Italy. The vines multiplied greatly there; and the Gauls having tasted the juice, and wishing to settle in the places where the vines grew, passed the Alps, and went to conquer both the borders of the Po. By degrees vines were cultivated all over France, and at last on the borders of the Rhine, the Moselle, Neckar, and other provinces of Germany.

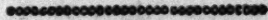
These observations may give rise to many important reflections. As the most barren soil is fit for the culture of vines, so it often happens that the poorest countries are favourable to science and wisdom. We have known, in provinces universally despised for their poverty, geniuses rise up, who have by their knowledge enlightened

other kingdoms. There is no country so desert, no town so small, nor village however poor, in which certain branches of learning have not been cultivated with success. They want nothing but encouragement. And how great an advantage would it be to us, if we were to take the trouble to promote as much as possible the culture of the human heart! Sovereigns, ministers, instructors of youth, how much might you contribute to the happiness of your fellow-creatures, and posterity also, were you, by exhortation, rewards, useful establishments, and other such encouragements, to endeavour to bring back wisdom, religion, and social virtues, into the ruined towns and miserable villages! Such endeavours are scarcely ever entirely useless. We are rewarded for it, or at least our descendants reap the fruits of it; and we should be numbered amongst those respectable men, who, by becoming the benefactors of mankind, secure to themselves the approbation of God, and the blessing of their fellow-creatures.

The vine, with its dry and shapeless wood, is an emblem of those, who devoid of the outward splendor of birth and honours, fail not to be very useful. How often does it happen, that men who live in obscurity, and whose appearance promises nothing, are however capable of actions, and perform enterprises, which raise them above all the great people on the earth.

Let us here reflect on Christ himself. To judge of him by the low condition in which he appeared, who could have expected from him

such great works, so wonderful, so salutary, to mankind? He has, however, performed them. This Christ, who, like the vine, was planted in a barren soil, has borne fruit which is a blessing and salvation to the whole earth. He has also proved to us, that one who is poor, despised, and miserable, in this world, may, however, labour successfully for the glory of God, and the good of mankind.



SEPTEMBER XIX.

DAILY WONDERS PERFORMED BY GOD.

THE whole universe, which still subsists in all its beauty and in its original order once established, is a miracle we have constantly before us. What a world in reality is this which we inhabit! How great the number, the variety, the beauty, of the creatures it contains! What hand but that of the most High could place in the immense expanse of the heavens, the sun, and all those stars, whose size and prodigious distance from us confound our imagination? Who could determine the course they were to run for so many millions of years that are passed? Who calculated so exactly the respective force of all these globes; and who established so perfect a balance between them and the air which supports them? Who placed this earth at so proper a distance from the sun, that it is neither too near nor too far from it? The vicissitudes of day

and night, the revolutions of the seasons, the innumerable multitude of animals, reptiles, trees, plants, and all that the earth produces, are the work of God. If such a wonderful world was created before our eyes, who would not consider it as one of the greatest miracles of Almighty Power? His particular providence is a constant proof of his greatness, his power, wisdom, and omnipresence. The continual care he takes of us, and the marked protection, of which there is nobody who has not had particular proofs; the different means he makes use of to lead mankind to their duty; the paths by which he conducts them to happiness; the adversity he makes use of to awaken and force them to self-recollection; the extraordinary events which he turns to the advantage of his purposes. Events which generally are produced by small causes, and under circumstances which appear to render them impossible: these are all so many effects, wherein we ought to acknowledge the hand of God continually acting for us; and if we properly attend to them, we shall every where trace his Providence.

SEPTEMBER XX.

THE DIGESTION OF FOOD.

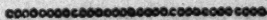
THE digestion is a wonderful and very complicated piece of mechanism, which we perform

every day, without knowing how, and without even taking the trouble to learn what is most remarkable and essential in so important an operation of the human body. Millions of men take their food every day, and perhaps without ever having once in their lives considered what was to become of the food they swallow. It is happy for us, that, in order to digest well, it is not necessary to know how it is performed; but it is still desirable to be informed, so as to have some idea, at least, of the operations of nature in this respect. We work the food, so that, after having been ground, attenuated, and moistened, it is in a proper state to be sent from the mouth into the windpipe. This is the last office in regard to digestion in which our will has any part, for all the rest is done unknown to us, and even without our being able to prevent it, if we wished it. As soon as a bit is put into the windpipe, it pushes it (by a mechanism peculiar to it) and conveys it into the stomach, where its own weight would not otherwise carry it. When in the stomach, the food is there reduced, by some particular means, into a soft paste of a greyish colour, which, after being sufficiently attenuated, passes into the first gut called the Duodenum. There the mass of food undergoes new changes. Several little vessels, which come from the gall vesicle, and from a gland placed behind the bottom of the stomach, which is called the Pancreas, terminate at the Duodenum, and pour into it the bile and pancreatic juice, which mix with the food.

There are besides in the guts a number of glands or kernels, which disperse their humours into the paste, and penetrate through it. It is after this mixture, that a real chyle is discovered amongst this mass; and there is much reason to believe, that the digestion is finished and completed in the Duodenum. The mass of food continues its way through the other guts, where it is constantly kept moist by the juices which separate into their cavities. The chyle begins then to pass into the lacteal veins, which open on every side into the guts, and afterwards terminates in the reservoir of chyle. This is placed in that part of the back where begins the first chine bone of the loins, and there springs from it the thoratic artery, which runs up all along the chest. The chyle flows through this artery, and mixing afterwards with the blood, goes into the heart, and from thence through all the veins of the body, after having lost its whitish or greyish colour.

This is a slight sketch of the manner in which the digestion is performed within us; a point so essential to our health, and even to our existence. Let us reflect how evidently the wisdom of God appears in all this. How many wonderful circumstances must unite for this operation. It requires that the stomach must not only have an inward heat, and dissolving juices in it, but also a peristaltic motion, in order to reduce the food into a soft paste, and change it afterwards into chyle, which disperses through all the limbs of the body and supplies them with blood and nourishment.

A liquor called Saliva is necessary, which has the properties of soap, and the virtue of mixing together oily and watery substances. It is necessary, that through the whole course which the food takes, there should be certain machines, to separate from the blood many humours which are required for the perfect elaboration of it, and to complete the chyle: It is necessary that the tongue and muscles of the cheeks, the teeth, and some other organs, should divide, grind, and attenuate the food before it descends into the stomach.—What infinite wisdom does all this prove! How unpardonable, were we not prompted by it to adore the Creator.



SEPTEMBER XXI.

THE BLESSINGS OF THIS LIFE GREATER
THAN THE EVILS OF IT.

NOTHING is more calculated to comfort us in disappointment, and distresses, than the admitting it as a principle, that there is more good than evil in the world. Let us in reality consult the most wretched of men, and ask if he can mention as many causes of complaint as he has motives for gratitude. It will appear, that, however great his misfortunes may be, they are not equal to the multitude of blessings he has received in the course of his life. To prove this truth more clearly, let us reckon the days we have passed in health, and the small number in which

we have been sick ; to the few vexations and sorrows we experience in domestic and civil society, let us oppose the many pleasures they afford us ; let us compare all the good and innocent actions by which the greater part of mankind make themselves useful, with the few hurtful actions they are guilty of ; let us count, if we can, all the pleasing sensations which each sense affords us, and all the pleasures belonging to every age, condition, and profession ; let us count the gifts which nature bestows in such abundance, and which human industry makes use of to furnish us with an infinity of pleasures and conveniencies ; let us reckon the satisfaction we felt, when we escaped any danger, or gained any victory over ourselves, or had done any virtuous or sensible action ; let us reckon all the blessings we remember to have enjoyed, and consider, at the same time, that we can recollect but the smallest part of them ; let us be convinced, that it is our being accustomed to blessings, that makes us so sensible of evils, that new prosperity makes us forget the former, and that, if the impressions of our misfortunes are so deeply engraved in our memories, it is precisely because they seldom afflict us ; let us compare the happy events we remember, (though but the smallest part of what we have enjoyed) to the evils, the use of which we are not yet acquainted with. I do not speak of all the evils we may remember, for I do not mean those which lead to good, and have been the source of many great advantages.

I do not speak of those evils, which, being preservatives from greater, are dispensed to mankind to make them better and more happy, or to instruct others by their example. These sort of evils are compensated by very beneficent effects. In the calculation I wish to make, we must only oppose to the blessings we recollect, the evils which we do not yet know the use of, and I say, that if we make this computation in calm and cool moments, and not in the time of affliction, vexation, anxiety, or sickness, we shall be convinced, that the good predominates greatly over the evils of the world. Wherefore, then, does man think so little of the continual proofs he receives of God's goodness? Why does he love to see the gloomy side of things, and torment himself with unseasonable cares and anxieties? Does not the divine Providence surround us with pleasing objects? Why then dwell always on our infirmities, on what we cannot have, and on the misfortunes which may happen to us? Why magnify them in our fancy, and perversely turn our eyes from all that might make us easy and chearful? But we are formed thus. The least distress fixes our whole attention, whilst a long train of happy hours pass away unobserved. We draw misfortune and sorrow upon ourselves, which would not happen, if we were more attentive to God's blessings. Let us banish opinions that must render us miserable. Let us be fully convinced that God has bestowed his blessings impartially throughout the world and that no man

has a right to complain, but, on the contrary, a thousand just reasons for praise and gratitude. If he sometimes tries us with affliction, his consolations soon pour balm into our souls. In his goodness, he vouchsafes to promise us happiness eternal and unclouded. He leads us by secret and unknown paths to the lot he designs us. Even the trials he now and then sends us have most merciful views, which we shall one day acknowledge. In the mean time, he spares us evils beyond our strength. His almighty and paternal hand protects us, and his eyes are ever upon us.

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SEPTEMBER XXII.

THE ENMITY BETWEEN ANIMALS.

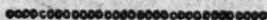
THERE is a constant war amongst animals. They continually attack and pursue one another. Every element is to them a field of battle. The eagle is a terror to the inhabitants of the air. The tyger lives by slaughter on the earth, the pike in the water, and the mole under ground. In these animals, and many others, it is the want of food which forces them to destroy one another; but there is an antipathy between some creatures which does not proceed from the same cause. It is, for example, very evident, that the animals which twist themselves round the trunk of the elephant, pressing it till the elephant is stifled, do it not with a design of procuring

food. When the ermine jumps up and fixes itself in the ear of the bear or the elk, and bites them with its sharp teeth, we cannot say that these hostilities are occasioned by hunger. Besides this, there is not an animal on earth however small that does not serve as food for others. I know very well, that to some this plan of nature appears cruel and wrong. But I will venture to maintain, that this very antipathy amongst animals is an excellent proof, that all is for the best. Take them in the whole, and it is certainly an advantage that some should subsist on others. For, on one hand, where it otherwise, a great number of species of them could not exist; and, on the other hand, it makes those useful instead of hurtful. Insects, and many reptile feed on carrion. Others fix in the bodies of certain animals, and live on their blood and flesh; and those same insects serve as food to others. Carnivorous animals, and birds of prey, kill creatures to feed upon them. There are some species which multiply so very fast, that they would be a burden to us, were there not a stop put to such increase. If there were no sparrows to destroy insects, what would become of the fruit and flowers? Were it not for the ichneumon, which seeks the eggs of the crocodile to destroy and break them, this terrible animal would multiply to a frightful degree. Great part of the earth would be a desert, and many sorts of creatures would never exist, were there no carnivorous animals. It may perhaps be said, that they might live on vegetables; but

if so, our fields would scarce be enough to feed the sparrows and swallows; and how could fish subsist were they not to feed on the watery inhabitants. There is reason also to suppose, that animals would lose much of their vigour and life, were it not for the continual wars amongst them. The creation would be less animated, the beasts would grow dull, the address, sagacity, and wonderful instinct with which they lay snares for, and surprize their prey, discovers to us very evidently the wisdom in the Creator. So far, then, is the enmity amongst animals from casting a shade over the wisdom and goodness of God, that these perfections, on the contrary, shine with double lustre from thence. It is consistent with the plan of the world, that one animal should persecute another. I confess that we might complain, if it occasioned the entire destruction of any one species: But this is what never happens, and the constant war amongst them is, on the contrary, what preserves the equal balance. Therefore the carnivorous animals are indispensable links in the chains of being; but, for this same reason, their number is small in comparison of useful animals. It is also remarkable, that the strongest and the most noxious of them have generally the least skill or cunning. They mutually destroy one another, or their little ones become a prey to others. For this reason nature has endowed the weakest animals with so much industry, and so many ways of defending themselves: They have instinct, keen senses, swiftness, address, and cun-

ning, to counterbalance the strength of their enemies. Who is there that will not observe in all this, infinite wisdom, and acknowledge, that the state of war, which at first sight appears so strange in nature, is, in fact, a real good? We should be still more convinced of it, if we were better acquainted with the whole system, the connection and relation between each creature. But this is a knowledge reserved for a future state, where the divine perfections will be more clearly explained to us. Even in this world, however, we may in some measure comprehend why the hostilities between animals are necessary. But one thing is absolutely incomprehensible, why amongst nobler creatures, amongst mankind, we should behold continual division, and destructive wars. Alas! it must be confessed to the shame of humanity that there are also amongst men, fierce and cruel destroyers, with this difference, that their hostilities are more frequent, and that they often make use of more dark and secret means to hurt one another. Nothing is more contrary to our destination than such conduct. The intention of God is, that every man should make himself useful to his fellow-creatures, and, as much as possible, render their lives agreeable and happy; in a word, to do them all the good offices in his power. Let us not oppose his merciful views, but endeavour to live in peace, and harmony. Let animals void of reason, persecute, hate, and destroy one another, but let us follow

the example of our Saviour, in loving and endeavouring to make each other happy.



S E P T E M B E R XXIII.

THE MORAL USE OF THE NIGHTS.

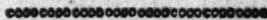
THE days begin to shorten, and the nights grow long. Many people are discontented with this part of nature's plan. They secretly wish, perhaps, that there was no night; or at least that they were all the year round as short as in the months of June and July. But such wishes are unreasonable, and betray our ignorance. If we would take the trouble to reflect on the advantages resulting from the vicissitudes of day and night, we should not be so hasty in our judgments; we should not make such groundless complaints; but rather acknowledge the use of night, and bless God for it. One circumstance alone should make us feel the moral advantage of the night, as it interrupts the course of most vices, or at least of those most fatal to society. Darkness obliges the wicked man to take some rest, and it gives some hours relief to oppressed virtue. The unjust and fraudulent tradesman ceases, in the night time, to deceive or cheat his neighbour; and darkness puts a stop to a thousand disorders. If men could be awake twice as long as they are at present, to what a degree would wickedness increase! In yielding to vice, without interruption, they would

acquire a horrid familiarity with sin. In a word, we may allow, that the longer the nights are, the fewer the crimes committed in the space of 24 hours ; and this is undoubtedly not the least advantage we gain from the night. How many mental pleasures, and how much information should we not be deprived of, if there was no night ? The wonders of the creation, which the starry sky presents to us, would be lost. Each night, we may in them behold the greatness of God. If every thing which reminds us of him is desirable, how must we love the night, which proclaims so forcibly his perfections ! If we made this use of it, no night would appear long ; none that might not be beneficial to us. Let us contemplate with attention the immense display of his Wonders. One single good thought which this may create, a thought which may leave an impression that would be of the greatest use to our hearts and minds. In general, the night is a happy time for those who love to meditate and reflect. The hurry and dissipation, in which we usually pass the day, leave us but little time to recollect ourselves, or to think seriously of our duties : But the tranquillity of the night invites us to the senseful employments. We may then, without interruption, commune with our hearts, and acquire the most important knowledge, the knowledge of ourselves. The soul may collect its forces, and direct them towards objects which concern its everlasting happiness. We may then banish the ill impressions received in the world, and

and wisdom are the most evidently visible, they are insensible to it, because they are used to it. This, which ought the more to raise their admiration and gratitude, renders them indifferent. Many are cold in regard to the scenes of nature, from ignorance. How many are there who are unacquainted with the most common objects. They every day behold the sun rise and set. Their meadows are moistened sometimes with rain or dew, and sometimes with snow. The most wonderful revolutions happen before their eyes every spring, but they do not take the trouble to inquire into the causes and purposes of these several phenomena; and, in that respect live in the profoundest ignorance. It is true that there always must be a thousand things incomprehensible to us, were we to study ever so much; and we are never more sensible of our limited understandings than when we undertake to search into the operations of nature. But we may at least acquire an historical knowledge of it; and the lowest ploughman may comprehend how it happens that the seed he sows in the ground shoots and springs up, if he will take the trouble to inform himself of it. Others disdain nature's works, because they are full only of their private interest. I am convinced there would be more attentive observers of nature, if, for example, the spider spun threads of gold, if the lobsters contained pearls, or if the flowers of the field could make old people young. We generally value things according to our interest or fancy. All other ob-

jects we deem unworthy our attention. Our self-love is so unreasonable, and we know so little our real interest, that we despise what is most useful to us. Corn, for instance, is most indispensably necessary to our subsistence, and yet we behold entire fields covered with this useful production of nature, without attending to it.—Many neglect the contemplation of nature through indolence. They love ease and sleep too well, to take hours from them in order to contemplate the starry sky. They cannot resolve to rise early enough to behold the sun rise. They would dread the fatigue of stooping towards the ground, to observe what admirable art there appears in the formation of the grass. And yet these people, so fond of their ease, are full of zeal and activity when the indulgence of their passions is the object. It would be a sort of martyrdom to the intemperate man, or to the gamester, to be obliged to devote to the contemplation of a beautiful starry sky, the hours he used to pass in gaming and drinking. A man who loves walking, and who would go many miles on foot to see a friend, would be out of humour, if desired to go two miles to observe a natural curiosity.—A number of people despise the works of nature from irreligion. They take no pains to learn the greatness of God. They have no taste for piety, or the obligations it prescribes. To praise God, to love him, and to acknowledge his blessings, are disagreeable duties to them. We have but too

much reason to believe, that this is one of the principal causes of the indifference of mankind to the beauties of nature. If they valued the knowledge of God above all other things, they would eagerly and willingly seize every opportunity of improving and increasing that knowledge. Two thirds probably of the world may be ranked amongst those I have mentioned. Would to God we could feel how ill it becomes mankind to be insensible to the works of the Creator, and how it degrades us below the very brutes. Have we eyes, and shall we not contemplate the wonders which surround us on every side! Have we ears, and shall we not listen to the hymns which every part of the creation chaunts to the praise of the Creator.



SEPTEMBER XXV.

UPON SEVERAL NOCTURNAL METEORS.

IN serene weather, we often observe a circular light, or great luminous ring round the moon, which we call halo, or crown. Its outline has sometimes the faint colours of the rainbow in it. The moon is in the middle of this ring, and the intermediate space is generally darker than the rest of the sky. When the moon is full, and much above the horizon, the ring appears more luminous. It is often of a considerable size. It must not be imagined that this sort of crown is really

round the moon. We must seek the cause of it in our atmosphere, where the vapours occasion a refraction of the rays of light which penetrate through them, and produce this effect. There appears sometimes round or on one side of the real moon, some false ones which we call mock moons. These are apparently of the same size, but their light is paler. They are scarce ever without circles, some of which are coloured like the rainbow, whilst others are white, and several of them have long and luminous tails. These also are but illusions produced by refraction. The light of the moon falling on watery, and often on frozen vapours, refracts in different ways, and separates into coloured rays, which, reaching our eyes, doubles the image of the moon. Sometimes, though very seldom, we see by moon-light, after a heavy rain, a lunar rainbow with the same colours as that of the solar, except that they are more faint. This meteor is also occasioned by refraction. When sulphureous and other vapours take fire in the higher atmosphere, we often observe streaks of light dart swiftly like rockets. When these vapours collect into a heap, take fire, and fall down, we think we see little balls of fire fall from the sky; and as, at that distance, they appear as large as a star, they are, for this reason, called falling stars. The common people fancy they are real stars, changing their place, to relax, or at least to purify themselves. Sometimes these imaginary stars are very brilliant, and beautifully coloured, slowly descending, and still ac-

quiring new lustre, till at last they are extinguished among the vapours of the lower atmosphere, and fall on the ground, where it is said they leave a slimy gluey matter behind them. Great balls of fire have also been seen, more luminous than the full moon, with tails sometimes trailing after them. They are probably sulphureous and nitrous vapours, which accumulate and take fire, for they generally traverse the air with great rapidity, and burst at last with a great noise. Sometimes, when the inflammable particles are of a very different nature, they disperse without noise in the upper regions of the atmosphere. The little flashes (seen in the summer often after great heats) are produced by the vapours in the atmosphere, which are less visible because they are higher up. This meteor is distinguished from real lightening by its never being accompanied with thunder. These flashes, properly speaking, are reverberations of lightening which is at too great a distance for us to hear the clap of thunder attending it. For a flash at the height of a quarter of a German league, may be seen at the distance of twenty-two leagues and a half; and the reverberation still farther, whereas we can scarce hear the thunder at two or three leagues distance. The *flying dragon*, the *dancing goat*, and the *burning beam*, with many other meteors, owe their odd names to their singular appearance. They are nothing but gross and slimy vapours, which ferment in the moist regions of the lower air; and which being pressed in differ-

rent directions by the agitated atmosphere, take those various forms to which people give extraordinary names. Several naturalists have produced some of these phenomena in miniature, by mixing certain substances together. Of all the nocturnal appearances, none is more remarkable or splendid than the Aurora Borealis. It is generally observed from the beginning of autumn till spring, when the weather is calm and serene, and when the moon does not give much light. The Aurora Borealis is not always the same. It is usually towards midnight, that a light like the dawn of day appears. Sometimes we observe streaks of light, white and luminous clouds in a continual motion. But when the Aurora Borealis is to rise in all its glory, we generally see (if the weather be calm and clear) towards the north, a black and thick cloud, the upper part of which is edged with a white luminous border, from whence dart rays, brilliant sparks, and resplendent pillars; which as they rise every moment grow yellow and red; afterwards meet, unite, and form luminous thick clouds; which terminate at last in pillars of all colours, white, blue, orange, or the finest purple, from whence continual rays of light dart out, and it is then that this object is in its full splendor and beauty.

The meteors just mentioned, render the long nights of the northern nations not only supportable, but even light and agreeable. When we behold these magnificent scenes, let us silently adore our Creator. They all proclaim his infinite greatness.

SEPTEMBER XXVI.

NATURE DISPLAYED.

HAPPY the man, whose genius, rising above the mere gratification of his senses, prompts him to enquire with the assistance of reason, into the true cause of things, and to pierce through the dark veil which conceals from mortals the mysteries of nature! How insensible are mankind! They stop to observe the course of a river. Supinely lying on the green turf, they behold the clear stream murmuring as it flows, the coolness of the water, the enamelled field, the verdure of its banks; every thing enchants their sight: But few know how to enjoy a still greater pleasure, to trace the source itself of these waters, the inexhaustible reservoir from whence they proceed. Thus, we generally look only on the outside of things. Our senses are charmed, without exciting our curiosity. Content with admiring the beauty of objects, we scarce skim the surface. Let us go deeper; let us dare to open a path to the recesses of nature. How noble is it to reflect on the principles of things, to contemplate their essence! It is to this that the wise man soars; all the rest is but the trifling amusement of the vulgar. It would be totally impossible to reckon all the blessings of nature, bestowed upon us; but let us endeavour to comprehend in some degree, how much we owe to our sovereign Benefactor. For this purpose, let us look into the places of our several enjoyments,

and first into our houses, and see what productions of the earth are there presented to us. The flowers, which appear but a mere amusement, are lovely ornaments to our retreats, and by the sweets they exhale, and their beautiful colours, charm and delight us. The orchards and kitchen gardens are not so pleasing to the eye, but they compensate by their utility, and they produce successions of excellent provisions for our tables during the whole year, a thousand times more wholesome than those invented by art to excite, or (more properly speaking) to corrupt, our taste. Let us go a little farther; let us quit the confinement of towns and villages, to enjoy the spacious fields where the industry of man produces that staff of life, that bread which supports the whole human species. The earth faithfully rewards the farmer's toil, and returns with incredible usury all that is laid out upon it. Unimpaired by age, it constantly resumes the charms of spring, and after having produced the most plentiful harvest, a winter's rest entirely repairs its losses. Near those fields we may see here and there barren hills, hanging grounds, where the plough cannot be used, and from which one might suppose nothing could be expected; but, behold! this poor soil becomes green, there grow upon it paltry looking trees, the most sapless and unfit for use of any, but the sand that nourishes them, moistened with a little dew, will soon force them to produce innumerable clusters of grapes, filled with a rich juice, which

affords a liquor extremely delicate, and at the same time so strong, that it preserves its perfection for many years, and bears long sea voyages, or the roughest conveyance to countries where nature has not supplied them with vines. Let us now enter into the woods. The light of day obscured by the thick foilage of the stately trees, the pleasing coolness, the still silence that reigns through all, combine to give them a striking air of majesty and greatness. What human industry would be sufficient to plant, to water, and to take care of those trees, so indispensible to us : for without them, where should we find fuel to prepare our food, and to protect us from perishing with cold ! God alone creates and preserves those forests, which are in so many ways of inestimable value to us. Let us now glance over our meadows and pasture. It is there that nature has shewn most complaisance to man, and where the beautiful and the useful is most blended. We behold them enamelled with flowers, and full of all sorts of herbs, which not only serve as pasture for animals, but many of them are delightful to us, and furnish us with excellent medicines. The chief use, however, of meadows and fields is to feed those animals most essential to us. How beautiful an object, how great an ornament to nature, is a river ! Whether we stop to reflect upon its motion, or the use it is of to us, or whether we wish to trace its origin, the beauty of its course charms us, the multitude of blessings it affords fills us with gratitude, and

the obscurity of its source raises our admiration. It is at first but a little stream trickling down a hill, and which the smallest pebble is enough to divert from its course: But soon, the overflowing of lakes, the melting of snow, the falling of floods, enlarge it. It makes itself a bed, and flows copiously into it; it enriches the fisherman's hut, and the labourer's dwelling; and after having been the ornament and delight of the country, it flows with majesty towards the cities, where it conveys plenty, by means of the ships it bears. "The river of God is full of water;" thousands of springs burst from the bosom of the earth, and the vast ocean embracing it, absorbs the whole. Lastly, even without mentioning the inside of our globe, where, as in a vast magazine, we find laid up for our different occasions, oily juices, fruitful salts of various sorts, quarries, mines, stones, metals, &c. Lastly, I say that the very air which we breathe is full of blessings. The clouds which collect there pour upon us these fruitful rains, which "water our furrows, and maketh them soft, and which causeth the land to flow with milk and honey." The same air, besides giving free passage to those winds which sweep away contagion, transmits also this beneficial light, these salubrious rays, which illumine, warm, and quicken all nature.

Here let us pause, and adore that beneficent, that almighty Hand, that only inexhaustible Source, that Ocean from whence flow all our blessings. Let us endeavour to deserve those that

are eternal, which as much surpasses the present, as the heavens are beyond the earth, eternity beyond time, the Creator beyond the creature.

SEPTEMBER XXVII.

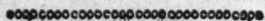
AMPHIBIOUS ANIMALS.

BESIDES four-footed beasts, birds, and fish, there is a sort of animal which lives either in or out of water, and is on that account called amphibious. They are all cold, something melancholy and forbidding in their look and form; dull and ugly in colour, of a nasty smell, and hoarse voice. Several of them are venomous. Instead of bones they have only gristles. Their skin is sometimes smooth, sometimes scaly. Most of them hide and live in dirty infected places. Some are viviparous, others oviparous. The latter do not hatch their eggs themselves, but leave them to the heat of the air or water, or lay them in dung. Almost all of them live by prey, which they obtain by cunning and strength. They can in general support hunger a long time, and live a hard life. Some of them walk, and others crawl; which forms them into two classes. To the former those with feet belong. The Tortoises, which are of that class, are covered with a strong shell like a shield. The land tortoise is the smallest. Some sea tortoises are five yards long, and weigh from eight to nine hundred pounds. There are different sorts of lizards;

some smooth, others scaly; some with wings, and some without. Those with wings are called Dragons. Amongst these without any, we reckon the crocodile, the cameleon, which can live six months without food, the salamander, which has the property of being some time in the fire without consuming, because the old ropy slime it emits puts out coal. Of all animals the crocodile is the most dreadful. This amphibious creature, which comes out of an egg not larger than the egg of a goose, grows to such a monstrous size, that it is sometimes 20 to 30 feet long. It is voracious, cunning, and cruel. Serpents form the second class of amphibious creatures. They have no feet, but crawl with a sort of winding virmicular motion, by means of scales and rings with which their bodies are covered. Their back-bones are constructed in a particular manner favourable to this motion. Many of these serpents have the property of attracting birds or small animals to prey upon. Seized with terror at the sight of the serpent, and perhaps stunned with its venomous exhalations and stench, the birds have not the power to fly, and thus fall into the open throat of their enemy. As the serpents can stretch their jaws considerably, they sometimes swallow animals thicker than their own heads. Many serpents have in their mouths fangs very like their other teeth. These are a sort of darts they let out and in as they please; and it is by this means that they slip poison into the wounds they make, which comes out of a bag

placed at the root of the teeth. This poison has the singular property of only being hurtful in the wounds, while it may be taken inwardly without danger. The serpents provided with the arms just mentioned, make but a tenth part of the whole species; all the others are not venomous, though they attack men and animals with as much fury as if they could hurt them. The rattle snake is the most dangerous of any. It is generally three or four feet long, and as thick as the thigh of a full grown man. Its smell is strong and offensive. It seems as if nature had given this, as well as the rattle to this creature, in order to warn mankind of its approach. It is never more furious and dreadful than when it rains, or when hunger torments it. It never bites till it rolls itself up round; but the quickness with which it does this is almost incredible. To roll itself up, to rest upon its tail, to dart upon its prey, to give the wound, and to retire again, is to the serpent the affair of a moment. Some of my readers may possibly say, Why then has God produced such and such things which appear hurtful to us? To the well-disposed, therefore, who seek for information, I address myself: Perhaps it appears to you, that lizards and serpents could not be created for the general good of mankind. But this judgment is hasty: For though a few of them do harm, it is certain that most of them are harmless. There is not a tenth part of the serpents which are venomous; and those are so formed, that it is easy to escape and

guard against their attacks. For example, dreadful as the rattlesnake is, it cannot conceal its approach. It is also remarkable that Providence has opposed to this animal an enemy which can conquer it. The Sea-hog every where seeks the rattlesnake to devour it, and a child is strong enough to kill the most terrible of these reptiles. A very slight blow with a stick upon its back kills it instantly. How unjust also would it be to consider nothing but the mischiefs these do, without reflecting on the advantages resulting from them? Some serve for food; others supply us with medicine, and the tortoise for its shell is of very great use.—In a word, the wisdom and goodness of God appears in this, as in every thing else. To reflect upon his perfections, to admire and adore them, such is our duty on beholding those creatures which appear to us to be hurtful. But it can never become us to condemn or murmur at his plans. Our understandings are much too limited to be able to discover the use for which these creatures are designed.



S E P T E M B E R XXVIII.

THE PERFECTION OF GOD'S WORKS.

WHAT can equal the perfection of God's works, or who can describe the almighty power visible in them? It is not only their multitude, and variety which we admire, but that each par-

ticular work is done with such infinite art; each so perfect in their kind; and the most minute production so exact and regular, as to proclaim the greatness and unlimited knowledge of their Author. We are with reason astonished at the different arts lately invented, by means of which things are done that would have appeared supernatural to our ancestors. We measure the height, the breadth, the depth of bodies; we know the course of the stars; we direct the course of rivers; we can raise or compress waters; we build habitations to float upon the seas; and we accomplish many other works which do honour to the human understanding. But what are all the inventions of men, what are their most magnificent, their most beautiful undertakings, in comparison of the least of God's works? How faint, how imperfect the imitation! How much beneath the original is the copy! Let the very best artist endeavour with all his powers to give to his works a pleasing useful form, finish and polish it with all imaginable care, and after all his trouble, all his industry and endeavours, let him look at this masterpiece through a microscope, and see how coarse, ill shaped and rough it will appear; how much want of regularity and proportion he will discover in it! But whether we examine the almighty works with the naked eye only, or with the best glasses, we shall still find them equally wonderful and beautiful. Perhaps through the microscope they will appear so different, that we should not think them what we had seen with the

naked eye, but we shall ever find exquisite order, exactness, and symmetry in each form. Such is the prerogative of unlimited power, that all his works are regular and in perfect proportion. From the greatest to the lowest of them, there is a wonderful order throughout. All is in such perfect harmony, all so well connected, that no void appears. In this immense chain of created beings, no link is wanting ; nothing is useless ; all is as necessary to the perfection of the whole, as each separate part is in itself compleat and perfect. Can we describe the innumerable beauties, the various charms, the pleasing mixture of colours, the different hues, and all the ornaments of the fields, the vallies, the mountains, the forests, plants, flowers, &c. ? Is there any work of God which has not its peculiar and distinct beauty ? What is most useful, is it not at the same time the most beautiful ? What an astonishing variety of form, figure, and size, do we behold amongst the inanimate part of the creation, but a still greater appears in the animate, though each is perfect, and nothing can be found otherwise in either. How wonderful must be the power, which by a single act of his will, has given existence to all the creatures ! But it is not necessary to go back to that time, when at his word every being was brought forth from nothing, and though created in an instant, yet in a state of perfection. Do we not each spring behold a new creation ? What can be more wonderful than the revolutions at those seasons ? The

vallies, the fields, the forests, all die in some degree towards autumn; and nature is stripped of its ornaments in winter. All animals languish; the birds retire and cease to sing; every place becomes desert; and nature appears insensible and dead. In the mean time a divine Power acts in secret, and labours for the renewal of nature, unobserved by us. Animation is restored, and all things are preparing for a sort of resurrection. How can we so often behold this magnificent scene, without adoring with the most profound veneration the power and glory of God! How can we ever breathe the cool refreshing air, without being led to such reflections! Does not God proclaim himself throughout all nature, as well as by revelation? Never can I repose under the shade of a tufted tree, or behold a meadow enamelled with flowers, a beautiful forest, or waving corn; never can I gather a flower, or enter a garden, without remembering that it is God who gives foilage to the tree, beauty and perfume to the flowers, and a pleasing verdure to the woods and fields." Struck with admiration, penetrated with gratitude, I cry out, "O Lord! how manifold are thy works! in wisdom hast thou made them all; the earth is full of thy riches."

SEPTEMBER XXIX.

FRUIT.

THIS is the happy season in which divine goodness lavishes all sort of fruit upon us in great abundance. The charms of summer give place to more solid enjoyments. The boughs of the apple-tree bend under the weight of that golden fruit, the beauty of which is still heightened by its purple streaks. The melting pear, the plum sweet as honey, display their charms, and seem to invite the hand of their master. Should we not be unpardonable if the sight of these blessings, which we owe to the munificence of God, did not create in us grateful reflections, and by such means sanctify the pleasures of autumn? With how much wisdom has the Creator dispensed fruits for the different seasons? It is true that in general it is in summer and autumn that nature presents them to us; but with the assistance of art we have them also in spring and winter, and can furnish our tables with some sort of fruit all the year round. From the month of June, nature of herself presents us with raspberries, gooseberries, and common cherries. The month of July furnishes us with cherries, peaches, apricots, and some sort of pears. The month of August seems rather to lavish than merely to give us fruit. Figs, late cherries, and a number of excellent sort of pears. The month of September already provides us with some grapes,

winter pears, and apples. The gifts which October bestows, are several sorts of pears, apples, and the delicious fruit of the vine. It is with this wise oeconomy that nature measures out and distributes her gifts ; on the one hand, that too great abundance may not be a load to us, and on the other, to procure us a constant succession and variety of enjoyments. It is certain, that in proportion as we advance in winter, the number of good fruits begin to diminish considerably, but art has taught us to preserve some for that season also. God did not think proper to dispense with man's trouble for such purposes, as it was a means to lead him to an active and laborious life. For this reason he distributed his blessings in such various ways ; ordained that they should be spoiled, or lose their value, if they were not properly attended to. What profusion of fruit is bestowed upon us ! Notwithstanding the ravages of birds and insects, there still remains a sufficient quantity to compensate for this loss. Calculate, if possible, the fruit which only an hundred trees bear in a good year, and you will be astonished at the prodigious increase. What was the design of such abundance ? If the preservation and propagation of trees was the only intention of it, much less certainly would answer that end. It is therefore evident that the Creator designed to provide food for man, and in particular for the poor. In bestowing so much fruit, he has furnished them with easy means of subsistence ; which is at the same time nourishing.

salubrious, and so pleasing, that they have no reason to envy the rich their far-fetched dainties, so often prejudicial to health. There is hardly any food so wholesome as fruits. It was with a beneficent view, that Providence gave them to us in a season when they are not only pleasing and refreshing to us, but also excellent in a medicinal way. Apples come seasonably during the heat of summer, because they temper the heat of the blood, and cool the stomach and bowels. The plums have an acid sweetness, with an oily softening juice, which may make them useful in many cases: they gently open the body, and correct the acrid humours which so often occasion inflammatory disorders. If some fruit, such as peaches, apricots, and melons are found to be unwholesome, it is a proof they were not designed for our climate, or at least for persons who cannot guard against the bad effects of too cold fruit, by wine or aromatics. Nothing certainly is more delicious than fruits. Each sort has a flavour peculiar to itself. This variety renders them doubly pleasing to us. Thus, God, like a tender father, provides not only for the support of his creatures, but also for their pleasure.

SEPTEMBER XXX.

THE FACULTY OF SPEECH HOW VALUABLE
IF NOT ABUSED.

TH E R E is nothing extravagant in all that has been said to enhance the value of the gift of speech. It is, in reality, the highest prerogative of man, and places us in a rank very superior to animals : for whatever traces may have been remarked in them of sounds to express their wants, &c. this can never be compared to human speech, which serves us to pursue a long course of conversation, introducing all sorts of subjects, to communicate to others the most abstract ideas, and to carry on the thread of argument from its source to the most remote conclusions. It is this use of speech we call conversation ; and such being its importance, it is evident that a rational being ought to regulate it so as to make the best use of it, and yet nothing is more neglected. The rules of conversation may be reduced to three heads. It ought to be the means of instruction, a bond of society, and a source of pleasure. Instruction is the first thing a man requires on entering into the world. If he is not then as a blank paper, the characters at least that are traced in his mind are so superficial and confused, that he wants assistance to make them clearer, and to impress them more strongly. Accordingly, the conversation of the first years of our life, are mostly devoted to instruction ; we ask the questions which our curiosity suggests from every

new object, and each answer, registered in our brain, increases our store of ideas. But the age of infancy, or even of youth, to which we limit this sort of conversation, is not enough. There is no time of life in which we may not obtain information. A sensible man may draw some out of every conversation, by leading others to speak on subjects they are best acquainted with, and which he himself does not know. We do not deign to converse with a trades' person, or a labourer, and yet those people know a thousand ingenious things of which we are totally ignorant. We meet persons who have travelled, who have been witnesses to certain interesting events; it is in our power to gain all they know, and will only cost us a little attention. We converse with a friend, whose courses and studies agree with our own. What can we do better than to communicate our ideas mutually, to assist each other in our common inquiries, and to resolve together the difficulties which may embarrass us: thus, in some measure to sharpen our wits, by rubbing them against one another, like the razor on the grinding stone. It has been often said and proved, that the condition of men would be most deplorable, without the sweets of society. But what enables us to form societies? It is speech and conversation. It is by the same means that mankind are enabled to keep up general society, as well as those of a lesser sort, which we call families, where a certain number of people are always ready to fly to the

assistance of each other, and to do them all sort of good offices. How invaluable therefore is conversation as the bond of society: Many may think the idea here given of conversation too severe. They may say that the mind cannot be always on the stretch for instruction, and that the bond of society does not always need binding closer by conversation; that there are many innocent and amusing subjects, with which these have no connection. This is very true, and takes in a third rule of no little consequence, which is, that, if conversation does not promote one of those purposes, it ought at least to be entertaining. Recreation is an essential part of life, as it gives us strength to fulfil the duties of it: None so natural, or so much within the reach of all the world, as engaging conversation, which makes time fly sweetly, and leaves the mind chearful and composed. But is it thus that men converse? Are these rules observed? Alas! they are but too too much neglected; and, with grief, I am going to shew the bad effects of it. Who is there that seeks information from society? Those first years devoted to study, are scarce over, when a young man, impatient of restraint, shakes off the yoke. He is ashamed to seem ignorant of any thing, and takes great care to avoid the least appearance of diffidence, which might give suspicion there was any thing in the world he did not know. With a decisive tone he cuts short whatever is proposed. At a more advanced age, we think ourselves still more above all instruction. Old

people especially are wonderful in this respect: What, teach me, at my age! This is a refuge for them which it is impossible to dispute. The strongest demonstration of their ignorance serves only to make them shrug their shoulders. Shall I mention women's conversation, those particularly who seek to please? Who is there that does not know it is the very reverse of knowledge, sense, (I had almost said *reason*, if I had not feared the appearance of a satire?) The neglect of the second rule of conversation, which enjoins us to make use of it as a bond of society, is much the more dangerous, and yet it is continually abused. How often do men, instead of conversing, tear one another to pieces, like wild beasts mad with rage? But let us turn from such to another scene, where milder voices are heard, groups of people, who appear to talk without emotion, and even with pleasure on their countenances. Let us partake of the supposed sweets of their society. But, O poisonous sweets! perfidious and malignant joy! It is at the expence of their neighbours that they are so complaisantly merry. It is a slander with its odious colouring, which spares neither friend or relation. From hence proceeds animosities, increased by reports, eternal discord and confusion. In such societies, the person most respected and carested, were he privately to listen to his expected praise, would find himself cruelly deceived. Many conversations, exempt from these faults, often degenerate into disputes, through haughtiness, pee-

vishness or obstinacy. We love contradiction, and yet cannot bear it from others. What must be the consequence? The chief cause which prevents conversation from being universally amusing, and which is the last rule I shall mention, is *egotism*, that eternal desire of speaking of one's self. Nothing more odd than conversations sometimes between persons so disposed. After the first words, the two parties equally contend who shall bring himself on the carpet." "I think so, I should do so," &c. The other, without attending in the least to what has been said, answers by speaking of himself. In the most serious situations, a person whom you consult, and whose advice and assistance you require, (without a loss of a moment's time,) loses those moments, in that vain intolerable employment of saying what *he* would have done in your place, and then tells you events of his own life, which your situation recalls. I do not exaggerate; three-fourths of conversation consists of these interruptions, where each person follows his own ideas, and thinks only of himself. How can harmony proceed from such discord? One infallible means of pleasing in society, is a reflection with which I shall close this discourse. It is to carry with us a constant disposition to appear interested in all that others say to us, listen to them with an air of satisfaction, and never to interrupt them, in order to speak of ourselves. This will never fail. Any one, that follows this maxim, will, without much trouble or wit, be more liked than the most

brilliant genius. I do not always lay it down as a precept, to restrain one's self continually for those who will make no return; we are not obliged to do it. It is true, it would make us pleasing in society, but should we ourselves be pleased? It is only by a unanimous consent of men desirous of information, scrupulous not to offend their neighbours, and attentive to please, that we can hope to see those abuses banished, and thus to make a rational use of a faculty intended to enoble and to bless mankind.

OCTOBER I.

HYMN TO THE PRAISE OF GOD.

ALL the heavenly host glorify the power and majesty of the Creator, and all the globes which roll in the immense expanse celebrate the wisdom of his works. The sea, the mountains, and the woods, created by a single act of his will, are the harbingers of his love, the heralds of his power. Shall I alone be silent? Shall I not attempt to offer up thanksgiving though the pure spirits themselves can offer but imperfect praise? By what power do those millions of suns shine with so much splendor? Who directs the wonderful course of the spheres? What chain unites them? What force animates them? It is thy breath O Lord! It is thy almighty word. Thou art all in all. Thou calledst the worlds, and they

obeyed. Then was our globe produced. The birds and the fish, the cattle and the wild beasts of the wood, and lastly man himself came to inhabit it, and rejoice. Our eyes are gladdened with variety of chearful scenes. Sometimes they wander over the green field, or contemplate forests whose lofty trees seem to touch the clouds. Sometimes they behold the dew-bespangled flowers, and trace the course of the limpid stream in which the trees are reflected. In order to break the force of the winds, and at the same time to afford us an enchanting scene, the mountains rise up, from whence burst forth the salutary springs. With rain and dew thou waterest the parched valley, and, with the zephyr's breath, thou coolest the air. It is through thee, that the hand of spring spreads the green lawn under our feet. It is thou that gildest the corn, and givest purple to the grape; and when the severe frost cometh to make all nature chill, thou coverest it with a dazzling veil. Through thee the mind of man penetrates even to the starry heavens. Through thee he knows the past, and can distinguish falsehood from truth, the appearance from reality. Through thee it is that he judges, desires, or fears; that he escapes from death and from the grave.—Lord! I will ever acknowledge thy greatness. Thou, who readest my heart, accept the emotions it feels, though unable to express them.

OCTOBER II.

THE EFFECT OF FIRE.

NOTHING in nature can exceed the violence of fire; nor can we, without astonishment, reflect on the effects it produces, and the extreme swiftness of its operations. But how few are there who attend to its effects, or think them worth observation, though we daily experience the great utility of fire in domestic life. Perhaps this is the very reason we are generally inattentive to it. We ought, however, to remember this blessing, and if possible by reflection learn the full value of it. There is one effect of fire which falls within every one's knowledge, that of dilating the bodies it penetrates. Irons put into a metal plate while they are new, swell so much in the fire, that they go in with difficulty; but as soon as they are cold, they are very easily taken out. This dilation produced by fire is still more visible in fluid bodies, such as wine, beer, and particularly in the air. If it were not for this property, the thermometer, by which we calculate the different degrees of heat, would be quite useless. Observe the effect of fire on inanimate and compact bodies; how soon it melts and changes them, part into fluid matter, and part into a solid of a different sort. It communicates fluidity to water, oil, fat, and to almost all metals. What renders these bodies susceptible of this change is, that their combination is more simple, and the parts which compose

them are more homogeneous than in other bodies, therefore the fire penetrates the more easily into their pores, and sooner separates the parts. This also causes these kind of substances to evaporate when the fire penetrates in great quantity and with violence through them. Some solid bodies undergo other sorts of changes. Sand, flint, slate, and spar, vitrify, in the fire; while clay turns into stone. Marble, calcareous stones, and chalk turn into lime. The variety of these effects does not proceed from fire, but from the different properties of the matter on which the fire acts. It may produce three sorts of effects on the same body, that of melting, vitrifying, and reducing to lime, provided the body be composed of the three several matters. The fire of itself produces nothing new; it only discovers parts which were concealed in those bodies. As for fluids, the fire operates in two ways upon them. It makes them boil and reduces them to vapours. These vapours are formed of the most subtle parts of the fluid joined with particles of fire. They rise up because they are lighter than the air.—In regard to living creatures, fire produces throughout their whole bodies the sensation of warmth. The life of man could not be preserved without this element, as we require a certain quantity of fire in our blood to keep it in motion. We every moment breathe new air, in which there is always some fire necessary to preserve this warmth and motion; whilst, on the other hand, we reject the air, which had lost

its spring in our lungs, and was loaded with superfluous humours. These reflections will confirm to us this important truth, that God has, in every instance, promoted the good of mankind, and that he has endeavoured to place proofs of his love every where before our eyes. How many advantages accrue to us from the effects of fire only? By the union of fire and air, the seasons return, the moisture of soil, and the health of man are preserved. By means of fire, water is put in motion, without which it would soon lose its fluidity. By the gentle motion it keeps up in all organized bodies, it gradually brings them to perfection. It preserves the branch in the bud, the plant in the seed, and the embryo in the egg. It prepares our food properly. It contributes to the formation of metals, and makes them fit for use. In fine, when we collect together the several properties of fire, we find, that the Creator by that means has spread a multitude of blessings over our globe. A truth which ought to make great impression on our hearts, and teach us to love the Author of our being, and inspire us with content. The more we search into the nature of things, the more we discover that all concur to the most perfect end. We every where behold magnificent plants, admirable order, constant harmony between the parts and the whole, between the ends and the means.

OCTOBER III.

THE INSTINCT AND INDUSTRY OF BIRDS.

THE birds have already afforded us many innocent pleasures. Now that the greatest part of these sprightly inhabitants of the air are going to disappear for a long time, let us once more reflect upon them, with a lively sense of gratitude and joy towards God, their Author and ours. How pleasing it is to contemplate the several instincts with which each bird is endowed ! None of them are useless or superfluous. Each is indispensibly necessary to the preservation or welfare of the animal. When, in the first place, we reflect on the instinct which leads birds to move, we find in that alone just cause for admiration. Experience may convince us, that bodily motions require something more than strength, or well formed supple limbs : It is not till after many trials and falls, that we are able to keep the balance, to walk with ease, to run, to jump, to sit down, and rise ; and yet these motions seem much easier to bodies constructed like ours than to birds. These animals have but two feet ; the body does not rest perpendicularly upon them ; it goes beyond the feet both before and behind, and yet a chicken can stand upright, and begin to run as soon as it is out of the egg. The young ducks, which have been hatched by a hen, know their element, and swim in the water without being directed to it by example or in

struction. Other birds know how at once to rise from their nests into the air ; to balance themselves there ; and take their course, beating their wings in equal measure ; to stretch out their feet ; spread their tail, and make use of it as an oar ; and often take long journies into countries very remote from their place of birth. How wonderful is the art we see them use in order to provide themselves food ; which art is born with them. Some birds, not in other respects aquatic, feed, notwithstanding, upon fish. They must necessarily have more difficulty in seizing their prey than the aquatic birds. What does their instinct teach them in this case ? They keep on the shore of this foreign element, and when the fish come in shoals, which they can perceive at a distance, they pursue them, skim on the surface, and dive suddenly into the water and carry off a fish. Who gave to the birds of prey their piercing sight, courage, and arms, without which it would be impossible for them to subsist ? Who points out to the stork where it may find frogs and other insects, on which it feeds ? It must carefully search for them in the meadows, as well as in the furrows of the field. It must even prolong its searches till near morning, when the other birds begin to waken. What incredible strength the condore must have, if it can, as 'tis said, carry off deer and oxen ! How can we reconcile it with the nature of the wild quail, (a character which no education can entirely correct) that maternal instinct which makes her

adopt little birds of every species, which she not only takes under her protection, but lavishes the tenderest cares upon them. What cunning the crows makes use of to conceal the prey they cannot devour at one time ! They hide it in places where other crows do not usually come, and when they are again hungry, how well do they recollect where they laid it ! Many years might be taken up in pursuing observations of this sort, without being able still to explain the chief mysteries which the instinct of birds presents to us ; but the little we know is enough to employ, in the most pleasing manner, those whose hearts are disposed to contemplate the works of nature, and to raise them to still nobler views. It is there that we ought to be led, not to dwell merely on the instinct and faculties of birds ; this ought to be but a first step to more sublime meditations. Let our admiration of these faculties raise us to God from whom these animals have received them ; and who has prepared and combined so many things for the subsistence and increase of this part of this creation. Let us not say, that it is from Nature the birds learn the art and industry which so much surprises us in them : Nature separated from its Author, is an unmeaning word.

OCTOBER IV.

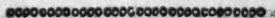
ANIMAL REPRODUCTIONS,

HERE we discover a new science of wonders, which appears totally to contradict the principles formerly adopted, in regard to the formation of organized bodies. It was a long time supposed, that animals could only multiply by eggs, or by producing young alive; but we have since found that this principle is liable to exceptions, as we have discovered certain animals bodies, which can be divided into as many complete bodies as we please; because what is wanting to each piece, when thus separated is soon repaired. It is no longer doubted that the polypus belongs to the class of animals, though it much resembles plants, both in its form and manner of propagating. The bodies of these insects may be cut in any way, and into as many pieces as they are cut, there will be so many complete polypuses. Even from the skin, or smallest bit cut off from the body there will grow one or more of the polypuses; and, if the several little bits cut off are put together by the ends, they unite, and become one and the same body. This discovery gave rise to other experiments: And it has been found, that the polypus is not the only animal which can live and grow, after having been cut in pieces. The earth-worm also multiplies when cut in two; to the tail part there grows a head, and the two pieces become two complete worms. After hav-

ing cut the worm in two, it would be to no purpose to put them together, in order to unite them. They would not join. They remain sometime in the same state, except that they grow more or less thin; then there appears at the end of one of the pieces a little whitish pimple, which gradually enlarges and lengthens. Soon afterwards, the rings are seen, at first very close together, but insensibly extending on all sides. New lungs, new heart, new stomach, and many other organs, form with the rest. The following experiment may daily be made with snails. Cut off the head, without going much below the two principle horns, and at the end of a certain time, the head will grow again. It is the same with lobster's claws. If one of them is broken off, and the lobster afterwards put into the river, it will, in a certain time, get a new claw. Another very wonderful experiment has been made, by M. Duhamel, upon the leg of a chicken. After the leg-bone, which had been broken, was perfectly recovered, and the calus formed, he cut off all the flesh of that leg, to the very bone; those parts grew again gradually, and the circulation of the blood was again restored. We are convinced, then, that some animals are perpetuated by being cut and divided, and that certain insects are produced in the same way as a branch shoots out of the trunk of a tree; that they may be cut in pieces; and, that the smallest of these pieces will produce others; that they may be turned inside out like a glove, and still

continue to live, eat, grow, and increase their kind. Here there arises a question, which no naturalist possibly can resolve in a satisfactory manner. How does it happen that the parts cut off grow again? It must be presumed, in this case, that the germ is spread over the whole body, whereas, in other animals it is confined to certain parts of it. The germ develops itself as soon as it receives proper nourishment: Thus, the cutting the animal only supplies the germ with the nutritive juices, which would otherwise have flowed elsewhere, had not their course been diverted another way. Each bit of a polypus or worm, contains in itself, like the bud of a tree, all the intestines necessary for the animal. Those parts essential to life, are dispersed over the whole body, and there is a circulation even in the smallest particles. Besides this, we cannot comprehend all the means which the Author of nature makes use of to dispense life and feeling to such a prodigious multitude of beings; neither have we a right to maintain, that the animals above mentioned are the only exceptions to the general rule, in regard to the manner of increasing. The fertility of nature, or rather the infinite wisdom of the Creator, surpasses all our weak conceptions. The hand which formed the polypus and the earth-worm has proved to us, that when necessary, it can make the animal form and constitution like simples or plants. It has done it still more in other cases; and descending gradually, has arrived at the utmost limits of animal nature.

But these limits are unknown to us. Let us, therefore, have an humble sense of our ignorance; let us admire and adore the supreme wisdom. Never is it more sublime than when we can no longer trace it. The animal reproductions remind me of the great change of our resurrection. What we now behold in miniature, will then appear in the great. What we observe in other bodies, we shall experience in our own; and from the least parts will proceed a body destined to enjoy eternal happiness.



OCTOBER V.

THE ORGANS OF TASTE.

THE faculty of tasting and distinguishing variety of food certainly adds to our enjoyments. The number of different fruits this season affords, naturally leads to this reflection. How much pleasure would we lose, if the apple, the pear, the plum, and the grape, tasted all alike to us. The sense of taste is therefore a gift which we owe to the goodness of God, and on which we ought gratefully to reflect.—But by what means do we distinguish and taste our food? It is by means of the tongue. For this purpose its surface is covered with little papillæ, a nervous substance, which enables us to distinguish the flavour of the salts as they dissolve upon the tongue. That the taste depends on the nerves, or sinews, may be observed by dissecting the

tongue; for, after taking off the membrane which covers it, there appears a number of roots where the nerves terminate; and it is exactly where the papillary nerves are, that we have the sense of taste. Where they are wanting our taste also fails. When we put high-flavoured things upon our tongue, we are scarce sensible of it till they are attenuated; and it is not till then, or till we put them on the surface of the tongue, that we perceive their flavour; consequently, the sense of taste is not in full force but where the papillary nerves are in greatest number, which is nearest to the throat. To be the more convinced that our taste proceeds from the nerves, we need only examine the tongue of a dog or cat. On the latter the papillary nerves are only placed on the back part of the tongue; the forepart of it has none, but their palate is quite full of these papillæ, by which means they have no sense of taste in the tip of their tongue. Let us for some moments dwell on the following reflections:—With what art must this organ of taste be formed, all the parts of which no anatomist has yet been able to find out? Is it not the effect of the greatest wisdom, that the tongue should have more sinews and fibres than any other member, and that it should be full of little pores, to let the salts and other savoury particles penetrate deeper, and in greater quantity into the papillæ? Is it not an effect of the same wisdom, that the nerves which stretch as far as the palate and throat to assist the mastication, should also reach to the eyes and nose,

as if to give notice to the organs of those senses to contribute their part towards distinguishing the taste of food? The duration of these organs is another subject of admiration. However delicate their construction, they last longer than steel instruments. Our clothes tear, our flesh withers, our bones dry up, but the sense of taste survives them all, if we do not wantonly destroy it. What admirable designs may we not discover even in the preparation of these organs? O man! thou art the only creature who knows that he is endowed with senses: the only one capable of raising himself to God, by the contemplation and use of them. Endeavour, with divine assistance, to employ these faculties properly. If thou wilt not acknowledge the wisdom and goodness of thy Creator, who is it then that shall pay homage to him? No creature enjoys what thou dost, even in the sense of taste; for the animals have but few things they like to feed on, whereas thy Creator has prepared thee variety equal to the abundance. Reflect on all that animal, vegetable, and even the mineral world affords you. The heavens and the earth, the air and the ocean, offer us their tribute. Wherever we cast our eyes we behold the gifts of God.

OCTOBER VI

THE PROVIDENCE OF GOD IN RESPECT TO
NATURAL EVENTS.

ALL that happens in the sky, earth, sea, or air, is according to the laws prescribed by nature. But it would be absurd not to acknowledge a particular providence of God, which directs natural things, and makes them concur with his views. He makes use of natural causes to chastise or reward mankind; and it is thus, for example, that by his command the air corrupts or purifies, and the seasons are fruitful or barren. He prevents, or he assists the designs of man, sometimes by winds or storms, sometimes by the flux or reflux of the sea. It is true, that God does not interrupt in general the course of nature; but it is no less certain, that nature cannot act forcibly without his assistance and concurrence. The parts of which the visible world is composed, have not their faculty to make use of their strength as they please. In the mean time, God can influence his creatures without interrupting the course of nature. Fire, water, wind, and rain, have their natural causes and particular virtues; but God makes use of them in a manner adapted to their nature, in order to fulfil his views. He makes use of the sun to warm the earth, and to render it fruitful. He employs the rain and wind to purify and cool the air; but it is always in the manner and degree that best suits his designs. A great part of the blessings and evils of this life

proceeds from the objects around us. Now, as God interests himself in all which happens to mankind, he must necessarily direct those objects, and influence all nature. On this is founded the rewards and punishments of virtue and vice. He gives peace and prosperity to crown the one, and sends when he pleases famine and plague to punish the other. In a word, all natural causes are in the hand of God, and are immediately under the guidance of his providence. Men themselves may furnish an example of this. How often does their industry triumph over nature? They cannot indeed change the nature of things; but they can make use of natural causes so as to produce effects from them, which would not have taken place without the art and directions of man. Now, if God has in some measure subjected natural causes to human industry, with how much more reason may he reserve to himself the government and direction of them. We may from hence conclude how necessary it is, that a particular providence should watch over the guidance of the world. Natural causes are certainly excellent instruments; but in order to make them useful, they ought to be in the hands of a wise Being. It would be unreasonable to wish that God should every moment change the laws of nature once established; that, for example, if we fall into the fire or into the water, we should not be consumed or drowned. Neither is divine Providence obliged to preserve us, if we shorten our lives through intemperance. For God is not

obliged to work miracles to save men from misfortunes drawn upon themselves by their own irregularities. It is our duty to attribute to providence all those particular and beneficent dispensations which relieve our wants and restore our hearts to peace: But all the disorders of nature are at the same time effects of God's anger, which serve to punish mankind. On this truth we found our prayers for the heavenly benediction, and our thanksgivings for all the blessings which God bestows upon us.

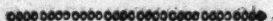
OCTOBER VII.

THE INEXHAUSTIBLE RICHES OF NATURE.

NATURE is so bountiful to us, so abundant in means to supply the wants of every creature; so rich in gifts, that they can no more be numbered than the drops of the ocean. How many things does one single man require during a life of sixty years, for his eating, drinking, and clothing, and for the sweets and conveniences of life; for pleasure, amusement, and society, without mentioning extraordinary cases and unforeseen accidents! From the king to the beggar, in all situation, conditions, and ages of man; from the infant to old age, in every country, and according to the different manners of the people, each man has his particular wants. What suits one will not suit another, and they all require

different means of subsistence. Yet we find that nature can answer all these demands, and that each individual is supplied with all the necessities of life. Since the first existence of the world, the earth has never failed to open her bosom. The mines have never been exhausted. The sea affords subsistence to numberless creatures. The plants and trees constantly bear seed, which shoot in due season, and become fruitful. Beneficent nature varies her riches, that one place may not be too much exhausted; and when some sorts of plants or fruit begin to diminish, others are produced; and it is so ordered that the instinct and taste of mankind should lead them to the most abundant productions. Nature is a wise œconomist, and takes care that nothing should be lost. Something is drawn out of every thing: Insects serve as food for larger animals, which in their turn are useful to man. If they do not afford us food, they furnish us with clothes, with arms, and means of defence; and if for none of these, they at least supply us with salutary medicines. Even when diseases sweep off some species of animals, nature repairs the loss by the increase of others. Not even the dust, the carion, or putrid corrupted matter, but has its use, either as food for insects, or for manure to enrich the earth. How beautiful is nature! Her finest clothing requires only light and colours. She is abundantly provided with them; and the scenes she presents are continually varied, according to the points of view in which they are

seen. Here the eye is struck with the beauty of form; there the ear is charmed with melodious sounds: and the smell is indulged with agreeable perfumes. In other places, arts add new embellishments to nature, by a thousand industrious works. The gifts of nature are so abundant, that even those which are continually made use of never fail. Her riches are spread over the whole earth. She varies her gifts according to the different countries. By means of commerce, she connects different nations; and the hands through which her gifts pass, make them more valuable by the continual circulation. She combines and mixes her gifts as the physician does his medical ingredients. The great and the small, the handsome and the ugly, the old and new, combined and mixed with art, form one whole equally useful and agreeable. Such are the inexhaustible riches of nature in the hands of God.



OCTOBER VIII.

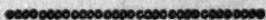
PETRIFICATIONS.

THE transmutation of several substances from the animal and vegetable kingdom into the mineral, is a circumstance in natural history well worth our attention. The first thing to remark in petrifications is their exterior form, which shews that these fossils have undoubtedly belong-

ed either to the animal or vegetable kingdom. It is very unusual to find human petrifications, or those of quadrupeds. The most extraordinary skeletons met with in the earth, are those of elephants, which are found even in many parts of Germany. Petrifications of aquatic animals are frequently met with. There are sometimes fish entirely whole and perfect, even to the smallest scales: But this is nothing in comparison of the multitude of shell-fish, and little worms, found changed into stone in the bowels of the earth. Their number is not only prodigious, but there are more different species of them than are to be found alive. Sea petrifications are found in great abundance all over the world. There are some on the tops of mountains, that are many millions of feet above the surface of the sea; quantities are found in the earth at different depths. All sort of petrified plants, or pieces of plants, are met with in the several beds of the earth; but there is often the impression only, the bodies themselves being destroyed. In many places, whole trees are found buried more or less deep into the earth, and turned to stone. These do not appear to be old petrifications. But how have all those petrified substances got into the earth, and particularly how can they have got upon such high mountains? How have sea animals been transported so far from their natural abode? Different causes may be assigned for this. Perhaps, these petrifications prove, that the greatest part of the earth was formerly covered with water.

And indeed, as in every place where we search, from the top of a mountain to the greatest depths into the earth, all sorts of marine productions are found, it seems as if it could not otherwise be accounted for. The great quantity of petrified shell-fish found at considerable heights, forming regular beds, give reason to believe the mountains were formerly the bottom of the sea, and so much the more so, as we know that the present bottom of the sea is exactly like firm land. We have hitherto but a very imperfect knowledge of the manner in which nature operates these petrifications. It is certain that nothing will petrify in the open air; for the bodies of animals or vegetables consume or corrupt in this element; so that air must be excluded, or at least not act, where petrifications are formed. Neither has a barren dry earth any petrifying quality. Running water may form a crust on particular bodies, but cannot turn them into stone. The very course of the water prevents it. It is probable, therefore, that petrifications require moist soft earth, mixed with dissolved stoney particles. The stoney juices penetrate into the cavities of the animal body, or the vegetable, impregnate and unite with it, in proportion as the parts of the body itself evaporates, or as they are absorbed by alkaline substance. We may draw some inferences from thence, which explain these phenomena of nature. All animals and vegetables are not equally capable of being turned to stone; for, in order to be so, they require a degree of hardness, to prevent them from cor-

rupting before they have time to petrify. Petrifications are generally formed in the earth, and require that the places where the bodies are placed should be neither too dry nor too wet. All sorts of stones which contain petrifications are the work of time, and consequently they are every day still forming; such as chalks, clays, sands, the magnet, and others. The petrified bodies take the nature of these stones, and become sometimes chalky, sometimes like slate, &c. If petrifications were of no other use than to throw light upon the natural history of our globe, they would from that circumstance alone be interesting: But we may also consider them as proofs of the operations and transmutations which nature produces in secret; and here again appears most wonderfully the power and wisdom of God.



OCTOBER IX.

EVERY THING IN NATURE IS GRADUAL.

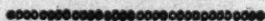
WE may observe in nature an admirable gradation, or insensible progress from a simple to a more compound perfection. There is no middle species which has not something of the nature of that which preceeds, or that which follows it. In a word, there is no void or leap in nature. Dust and earth form the principal and the component matter of all solid bodies. It is, accordingly, found in all those which human art has analyzed.

From the mixture of salts, oil, sulphur, &c. with the earth, there result different kinds of soil, more or less compound, light or compact. This naturally leads us to minerals. The variety of stones is very great; their form, colour, size, and hardness are very different. All sorts of metallic and saline particles are found in them; and from hence proceed mineral and precious stones. In the last class there are some with fibres, and a sort of leaves; such as slate, talc, the lithophites, or marine stony plants, and the amianthus, or the stony flower of the mine; which leads us from the minerals to vegetables. The plant which appears to be the lowest among vegetables is the truffle. Next comes the numerous species of mushrooms and mosses; between which the hoar or mould seems to take its place. All these plants are imperfect; and, properly speaking, only form the limits of the vegetable world. The more perfect plants divide into three sorts, which are dispersed over the whole earth: grass, shrubs, and trees. The polypus seems to unite the vegetable to the animal race. From the outward appearance, this singular production would only be taken for a plant, if it was not known to perform real animal functions. This zoophite forms the link between plants and animals. Worms are the lowest of the animals, and lead us to insects. Those worms which have their bodies inclosed in shells, seem to unite insects to shell-fish. Between them, or rather next to them, come reptiles; these by means of the water-snake, are linked with the fish

The flying-fish leads us to the bird species. The ostrich, which has legs something like the goat's, and which rather runs than flies, seems to link the birds with the quadruped. The ape joins hand with man and beast. There are gradations also in human nature, as well as every thing else. Between the most perfect state of man and the ape, there are a wonderful multitude of links; how many more still are between men and angels! How many between the archangel and Creator of all things! Here we behold a new train of gradation, new plans, and new perfections. But an impenetrable veil conceals from us those of the world to come.

Let us reflect on these gradations of nature: What has been said is sufficient to shew us, that every thing in the universe is closely linked together. There is nothing without its design; nothing which is not the immediate effect of something which preceded it, or which does not determine the existence of something which is to follow. Nature goes by degrees, not suddenly from the component to the compound, from the less to the more perfect, from the nearest to the more distant, from the inanimate to the animate, from bodily to spiritual perfection. But how imperfect still is our knowledge of this immense chain of beings! We can but half distinguish them, and know but a small number of ill connected broken links; and yet, defective as our knowledge is in this respect, it is enough to give us the highest idea of the wonderful chain, and

infinite variety of beings of which the universe is composed. The whole leads us to thee, thou supreme Being, although there is between thee and us a distance which no understanding can measure. Thou art the only Being beyond the chain of nature. From the grain of sand to the cherubim every being owes its existence and perfection to thee.



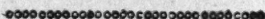
OCTOBER X.

THE FALL OF THE LEAF

WE begin to perceive the effects of approaching winter in the woods and gardens. Almost all the plants are losing their leaves, their chief ornament. The most natural way this can be accounted for is from the cold; for the leaves are no sooner covered with frost than they begin to fall in abundance, and all the vegetables are stripped of their cloathing. It cannot be otherwise, as the cold causes the sap to stagnate in the plants. But the cold is not the only cause of the leaves falling; for they fall when it does not freeze the whole winter, and when the trees are even put into green-houses to preserve them from cold. It is therefore probable that other causes also contribute to strip the trees. Perhaps they wither, because the root no longer supplies what is necessary for their perspiration. For it is certain that the branches grow in thickness when they no longer grow in length. At the time, then, when the

branches continue to grow thick, and the stalks of the leaves do not do so, the fibres of the leaves must necessarily loosen from the fibres of the branches, and then the leaves fall off. But we must not suppose, that these fallen leaves are entirely lost, and of no use. Reason and experience teach the contrary. These leaves which grow rotten when they are fallen, make manure for the ground. The snow and rain washes the salts out of them, and conveys them to the roots of the trees. These strewed leaves heaped together upon the young plants, preserve their roots. They cover also the seeds, and keep them warm and moist. This is more particularly observed in respect to the oak leaves. They afford excellent manure, not only to the tree itself, but also to its shoots; and are also very useful for forest pasture, as they encrease the growth of the grass on which they fall and rot.—This is so important an advantage, that the fallen leaves are never taken up to make dung of, unless they are in such abundance in the forests, that the grass is rather choaked up than nourished by them.—Leaves may serve for manure in different ways. They are spread in stables instead of straw, and make a good litter for cattle, or are mixed with common dung. This mould is particularly useful in gardens, where they make layers of it, which assist greatly the growth of fruit and young trees. But it may be said possibly, that the fall of leaves is destructive to a multitude of insects, who live on trees and plants. It is true that au-

turn sweeps away whole shoals of insects with their nests ; but does it follow from thence, that these little creatures perish ? Why may they not live even on the ground under the leaves, which cover and guard them from the cold ? The fall of the leaf is an emblem of this life, and the frailty of all earthly things.



OCTOBER XI.

DIFFERENT SORTS OF EARTH.

WE can only form conjectures of the inside of the earth. Those who work in the mines have never been able to go lower than 900 feet, which is scarce the twentieth part of a German league. If they attempted to go farther the too great pressure of the air would kill them, supposing even they could protect themselves from water, which fills more and more in proportion as they descend lower. Now what is the twentieth part of a German league in comparison to half the diameter of the earth, which is 860 leagues ? The inside of the earth must consequently be in a great measure unknown to us. The labours of the miners have scarce reached below the first coat of it. All that we know is, that when they dig some hundreds of feet, this coat is found to be composed of several different layers or beds placed one over another. These beds are much mixed ; and their direction, substance, thickness, and respective positions, vary considerably from

one league to another. Generally under the common earth in gardens they find white clay and rich earth ; but sometimes the sand, clay, and marl mix by turns. The manner therefore in which the different beds are classed is rather arbitrary ; but in comparing the observations which have been made, the best account appears to be that which divides them into seven sorts of earth.

Black earth is composed of putrid vegetable or animal substances. It contains salts and inflammable matter. This is, properly speaking, dung. *White clay* is more compact than the black earth, and retains water on its surface longer. *Sandy ground* is hard, light, and dry. It does not retain water, or dissolve in it. It is the worst of all land, though some plants do grow in it. *Marl* is softer, more mealy, and attracts moisture better. *Marshy ground* contains salt of vitriol, which is too sharp for the plants. *Chalk* is dry and hard : some plants, however, grow in it. There grow some even in stony ground. The smoothest stones, however bare of earth, are, at least, covered with moss, which is a vegetable, and we see birch growing between the stones, and in the crevices of rocks, to a considerable height. The Creator has most wisely prepared the different sorts of earth of which the beds are composed. For to mention nothing more than the principal advantages which result from them, these several beds of sand, gravel, and light earth, give passage to spring water, which filters in running over them, becomes soft, and then dispersing on every side,

supplies water for general use. Those beds are the reservoirs of springs. It is remarkable that they are to be found in every country near the surface of the earth, and that they are generally composed of a light earth. If it is sometimes mixed with hard and more gravelly soil, it purifies the water so much the more. This variety of soil is very useful also for vegetables. It is from this circumstance, that herbs, plants, and trees, grow of themselves in some countries, while they can only be produced by art in others. All that art can do is to imitate nature, which prepares for the plants the soil, the nutritive juices, and the warmth most proper for them. The variety of soil will make herbs, trees, and roots, (though of the same kind) differ according to the soil they grow in. It often happens in the same soil, that some plants thrive, whilst others fail. The same fruit has a different flavour in one country from what it has in another. When plants have weak small fibrous roots, without much sap, they ought to be sowed and planted in a sandy light soil, that the roots may spread more easily by meeting with no resistance, that the rain may better sink into them, that they may not meet too many saline, acid, and oleaginous particles. It is asserted, that in the space of 48 hours, lettuce, colliflower, salad, &c. may be produced fit to eat, by steeping the seed in brandy, and afterwards putting it into ground mixed with pigeon's dung and lime dust.—Vegetation always require a prepared soil.

These observations lead us to acknowledge the wisdom with which the Creator has prepared every soil for the production of plants, for the use of his creatures. How unjust, therefore, would it be to complain of the sterility of such and such lands. If there are any which appear less fertile than others, he has made amends for this defect by greater advantages, or he inspires man with so much the more industry.



OCTOBER XII.

WINE.

WINE is a gift we owe to the divine goodness, and which ought to create in us admiration and gratitude. God not only gives us bread, and other food in abundance, but has vouchsafed also to indulge us in pleasure, and has created the vine, to render our lives the happier, and to be of use to our health. Other drinks, whether natural or not, do not equally produce these effects. Wine alone can banish sorrow, and give those spirits which both body and mind require. Wine recruits strength when exhausted by fatigue. Bread enables a man to act, but wine makes him act with spirit, and renders labour easy. Spirituous liquors cannot spread over the countenance that air of cheerfulness which wine gives. Let us here reflect on God, who gave to this salutary juice qualities so superior to the poorness of its origin, and the dryness of its na-

tive soil. The Creator produced these effects, only by the three chief particles of which all wines are composed, oil, salt, and volatiles. How greatly does divine goodness shew itself in the abundance and variety of wines granted to us. The different sorts are numberless. They vary in colour, smell, taste, quality and duration. We may say, that there are almost as many sort of wines as soils; and the Creator has allotted to each country such wines as are best adapted to the climate, as well as to the constitution and way of life of its inhabitants. But how sad is it to see men conduct themselves as they do, in respect to the use of it! There have been legislators who severely prohibited it, and this not from consideration for the health and morals of the people, but from false œconomy, or sometimes merely through fanaticism. It is certain, at least, that it is to those united causes we most attribute Mahomet's prohibition of this liquor. This objection to wine is so much the more irrational, as most of those who prohibit the use it do not forbid the eating of grapes. Another fault, which many are guilty of, is the adulteration of wines, particularly those who mix lime, white lead, and other noxious ingredients with them. The human heart in this displays its worst qualities. Can any thing indeed be more horrid? A poor person, who is sick, tries to relieve his misery, and out of the pittance his labour affords him, purchases a little wine to recruit his strength, and soften his pains, and they who adulterate wine have the barbarity to aggravate his evils, and to make him still

worse, by presenting him poison, which, instead of restoring the health and strength he hoped for, may be the cause of his death. But a still more shameful and deplorable abuse of it is, when men poison themselves by excess. This liquor is a salutary medicine, which supports animal life and the vital spirits; it warms and animates the blood, and restores our strength; but the continual and excessive use of wine makes it no longer salutary. This liquor is to the human body, what dung is to trees, it forwards the fruit, but hurts the tree. A wise gardener does not continually dung and manure. He only does it at proper seasons. He gives manure to his trees when they require it, and only gives it in proportion to their nature and want of it. This is the proper regimen for wine. Let us always remember it is only given to us to refresh and recruit our spirits; let us never abuse a blessing bestowed upon us by divine goodness.



OCTOBER XIII.

MIGRATION OF THE BIRDS.

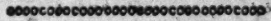
THIS is the time when numbers of the birds, which during summer had lived and found food in our fields, woods, and gardens, are going to quit our climate for other countries. There are but few of them which pass the winter with us; the loriote, the woodpecker, the crow, the raven, the sparrow, the wren, the partridge, and the

thrush. The rest leave us almost the whole winter. This migration is wonderful in all respects ; and if we have not much attended to these creatures while they were with us, let us at least think of them now they have taken leave of us. Perhaps it may engage us to take more notice of them when they return in spring. Some sort of birds, without taking their flight very high, and without separating from one another, draw gradually towards the south, to seek seeds and the fruit they prefer ; but they soon return back. Others, which are called birds of passage, collect together at certain seasons, go away in large bodies, and take their flight into other climates. Some kinds of them are content with going from one country to another, where the air and food draws them at certain seasons. Others cross the seas, and undertake voyages of a surprising length. The birds of passage most known, are quails, swallows, wild ducks, plover, woodcocks, and cranes, with some others which feed on worms. The quails in spring go from Africa into Europe in order to enjoy a more moderate heat. They go in flights, and look like clouds. They often fall through fatigue into ships, and are easily taken. The method of the swallows is different ; some cross the seas, but many of them stay in Europe, and hide themselves in holes under ground, or in marshes, fastening themselves to one another, claw against claw, and bill against bill. They gather thus together in heaps, out of the way of men and animals.

Wild geese, and cranes also at the approach of winter, seek milder climates. They all assemble on a certain day, and divide company. They generally form themselves into two lines united in a point, like a Λ reversed, with a bird at their head, and the rest in rows, which always extend in that manner. The goose or crane, which forms the point, cuts the air, and makes way for those which follow; and these always lay their bills on the tails of those which go before. The leading bird is only charged with this commission for a time; he goes from the point to the tail in order to rest, and he is relieved by another. But all birds of passage do not assemble in flights. Some take the voyage quite alone; others with their mates, and all their family; others in small numbers. They make their passage in a very short time. It has been computed that they may easily go 200 miles, in flying only six hours, a day, supposing them to rest now and then in the day as well as at night. According to this calculation, they might go from this country, even as far as under the line, in seven or eight days. This has been verified, as swallows have been seen on the coast of Senegal, from the ninth of October, which is eight or nine days after their departure from Europe. These migrations of the birds cannot be too much admired. Certainly the difference of heat and cold, and the want of food warns them to change place. But what is the reason, that when the air is so mild that they might remain in it, and that they find

enough to eat, they still never fail to go at the appointed time? How do they know that they will find food, and the proper degree of heat in other climates? What is the cause of their going all the same time out of our countries, as if they had unanimously fixed before hand their day of departure? How do they contrive in dark nights, and without knowing the countries, to pursue their direct road constantly? These and other questions on this interesting subject, are embarrassing, and have not yet been answered in a satisfactory manner, because we are not enough acquainted with the nature and instinct of these animals. We may, however, behold in these migrations the wise and benificent direction of Providence. What wonderful means are made use of to preserve and give food to certain birds! With what tender care is their subsistence pointed out to them when it fails them in some regions! Let us learn from thence, that every thing throughout the vast empire of nature, is planned with infinite wisdom. Is not instinct to the birds of passage what reason is to man? and does it not equally instruct them in this point of changing place in proper seasons? How we ought to blush at our incredulity, our doubts, and our anxieties, when we reflect on the admirable guidance of Providence! God, who points the way to the birds in the air, will he not with equal goodness guide us whom he has vouchsafed to endow with reason? Shall man, the lord of all, be less the object of

his care? Let us then with joy confide in his merciful protection. Let us walk in his ways, and we cannot fail of happiness.



OCTOBER XIV.

THE VARIETY OF TREES.

THERE is the same variety among the trees as in the vegetable productions. Some are distinguished by their strength and toughness, like the oak. Others are tall and slender, as the elm and the fir tree. There are some, such as the thorn and the box, which never grow high. Some have rough and uneven coats, while others are smooth and fine, like the birch, the maple, and poplar. Some are made use of in nice ornaments for the apartments of the great and rich, while others serve for common and more necessary purposes. Some are so slight and delicate that the least wind might blow them down; others stand unshaken, and resist the violence of the northern blasts. Some grow to a prodigious height and thickness, and every year, after they are a hundred years old, seems to add to their circumference; while others require but a very few years to come to their full growth. Pliny, in his time, admired those great trees, the shell or bark of which was thick or large enough to

be made into sloops to hold thirty people: But what would he have said to those trees in Congo, which (when hollowed out) make vessels to contain 200 men, or of those, which, according to the account of travellers, are eleven feet in diameter, and can bear 4 or 500 stone weight carried on them. There are some of this kind at Malabar, which are said to be fifty feet in circumference. The cocoa tree is one of them, a sort of palm-tree, some of which have leaves large enough to cover twenty people. The *tullipot*, a tree which grows in the island of Ceylon, and for height resembles the mast of a ship, is equally famous for its leaves. They are so immense, that it is said that one single leaf can shelter fifteen or twenty men from the rain. They are so supple when dried, that they may be folded up like fans, and are then extremely light, and appear no thicker than a man's arm. There are still on Mount Lebanon twenty three old cedars which are said to have escaped the deluge; and, if so, they must be the strongest trees in the world. A learned person, who saw them, assures us that ten men could not encompass one of those cedars: They must therefore be thirty, or thirty six feet in circumference, which does not appear too much for trees some thousands of years old. The gum trees, which grow in the islands of America, are generally twenty six feet in circumference. It is not likely, then, that the cedars are as old as they say, though it is certain that trees live to a great age. There are apple

trees above a thousand years old; and, if we compute the quantity of fruit such a tree bears annually, we must (as has been before mentioned) think with astonishment of the prodigious fertility of a single pippin, which could furnish all Europe with trees.

The great variety amongst trees reminds me of the difference we observe amongst men, in regard to their situations in life, their way of thinking, their talents, and the good they do. As there is not a single tree in a forest which may not be of some use to its owner, so there is no one in society who may not be useful. One, like the oak, gives an example of firmness, and of unshaken constancy, which nothing can move. Another, has not equal fortitude, but has more complaisance, and conforms to others: He is flexible as the willow, and yields to a breath of wind. If he is virtuous, he will only comply in lawful and innocent points; but, if he is indifferent to his duties, he will always embrace the strongest side. However different the trees may be from one another, they all belong equally to the Sovereign of the world; all are nourished by the same earth; all warmed by the same sun, and refreshed by the rain equally. Would to heaven that all men, however different from each other, would unite in acknowledging that they are all equally God's creatures, equally subject to his power, equally the objects of his tender mercies; all indebted to him for their existence and support, as well as for the talents with which they

are endowed. The cedar which rises majestically upon the top of Libanus, and the briar which grows at its feet, are equally nourished by the juices of the earth, and the rains. So is the divine blessing equally necessary to the rich as to the poor. The high and mighty amongst men should always remember, that it is to God alone that they owe their elevation and greatness. By him only can they be preserved; for, in an instant, he could root them out, and sink them low as the dust. This thought will repress every emotion of pride, which might arise in our hearts, and inspire us with due submission and obedience to the Author and Preserver of our lives.

OCTOBER XV.

THE TEMPERATURE IN THE DIFFERENT CLIMATES OF THE EARTH.

IT seems as if the temperature and warmth of countries must depend on their situation in respect to the sun, as it casts its rays in the same manner on all countries which are in the same latitude. But experience tells us, that heat and cold, and all the temperature depend on many other circumstances. Seasons may be very different in places under the same pallel, and are, on the contrary, often very like under very different climates. Therefore, as accidental causes may make the heat very different in the same latitude,

and as it is very far from being such as the distance of the sun would seem to promise, it is difficult to determine exactly the seasons and temperature of each country. The neighbourhood of the sea renders the climate milder. England and the coasts of Norway are strong proofs of it: The sea may be covered with ice near the shore, because it mixes there with fresh water; but it never happens at any considerable distance from land, both from the salt of which the sea is full, and from its being in continual motion. By the sea not being frozen in winter, the climate of the adjacent countries is milder. On the contrary, the higher a place is above the sea, the colder it is. The air is not only thinner there, and consequently contains less warmth, but the greatest part of the heat produced by the earth's reflecting the rays of the sun, falls on low places and vallies, and does not reach heights. Besides, if there is, as it is pretended, a subterraneous and central fire, the highest places are more distant from it. *Quito* is almost under the line, but the heat is moderate from its high situation. In general, those sort of countries have serene and clear air, and an equal temperature. High mountains attract clouds, which occasion more frequent rains and storms in hilly countries than elsewhere; and it has been observed that it scarce ever rains in the plains of Arabia. Countries where there are great extensive forests are very cold: the ice melts more slowly there in winter, because it is covered with the shade of the trees. The ice makes the upper

air cold, and this delays the thaw. Another circumstance also tempers the heat of warm climates: Their days are not long, and the sun does not remain long above the horizon. In colder countries the summer days are very long, which makes them warmer than could be expected. The serenity of the sky, the clear light of the moon, and the long twilights, render long nights supportable. Under the torrid zone, the seasons are not so much distinguished by winter and summer, as by dry and wet weather; for when it ought to be summer, that is, when the sun is most above the horizon, and its rays fall in as direct a line as possible, then come the rains, which fall more or less for some time. But in those countries the most pleasant season is that in which the sun is at the lowest. In the countries beyond the tropic, the weather is generally more uncertain than within the tropic. It is in spring and summer that the winds are highest. In winter the ground freezes more or less deep, but seldom in our climate more than three feet. In more northern countries, it freezes deeper in winter, and only thaws a few feet in summer. Stagnant waters, and even rivers are covered with ice, first near the shore, and then over the whole surface of the water. The different qualities of the soil, as they retain more or less of acquired heat, contribute also in some degree to vary the climate.

In all these plans, what wonderful wisdom and goodness appears! In thus regulating the seasons

and climates of the different countries, the Creator has made every part of the earth habitable. We often form wrong opinions of the torrid and the frozen zones; and foolishly imagine that the inhabitants of those regions must be most miserable people. Happily for the world, and to the great satisfaction of all feeling hearts, it is certain, that the people of the most distant countries, without even excepting those who live under the line or under the pole, enjoy the portion of happiness suited to their nature and destination. Each country has its advantages and inconveniences, in such equal proportion, that it would be difficult to decide which of them merits the preference. There is not a corner of the world in which God has not displayed his goodness.

OCTOBER XVI.

ATMOSPHERE OF THE EARTH.

THE air which surrounds the earth is not as pure and subtle as æther; for it is loaded with all the particles or vapours which are continually rising out of the earth, and particularly from the water. This is called atmosphere. Its lower region, that is to say, what is nearest to the earth, is pressed upon by the upper air, and from thence becomes more thick and dense. This is experienced by those who go to the top of high mountains. Their breathing becomes more painful in

proportion as they ascend. But it is impossible to ascertain the exact height of the atmosphere, because we cannot rise very high in the air. Neither can we draw a positive inference from the duration of twilight, how far this mass of air extends. For, supposing the morning twilight to begin, and evening twilight to end, when the sun is 18 degrees below the horizon; and that the latter twilight is produced by the rays which strike the earth, and are reflected by the highest parts of the atmosphere, there would still remain many difficulties to clear up.—The atmosphere is divided into three regions. The *lower* one reaches as high as where the air receives no warmth from the rays which the earth reflects. The *middle* region begins where the preceding one ends, and goes as high as the highest mountains, or even as far as the highest clouds, and is the space where the hail, rain, and snow collect. This region is much colder than the lower; for it is only warmed by the rays which fall perpendicularly, and in a direct line upon it. But the *third* is probably still colder. It reaches from the middle to the extremity of the atmosphere, and we cannot precisely ascertain its limits.

The particles which rise out of the earth, and form the atmosphere, are of different natures. They are watery, earthy, metallic, sulphureous, &c. Now as some abound more than others in certain parts of the earth, it occasions great variety in the air, and this difference is very perceptible even at a little height. A heavy air is

more wholesome than a light one, because it promotes the circulation of the blood, and insensible perspiration. When the air is heavy it is generally serene; whereas a light air is always attended with clouds, rains, or snow, which makes it damp. Vapours increase the weight of the air; and particularly when the heat sends them up very high, the air is still light notwithstanding the watery vapours with which it is filled. Too great a drought dries up the human body, and is consequently very hurtful, but it is seldom the case except in very sandy countries. A damp air is also very unwholesome, for it relaxes the fibres, stops the insensible perspiration, and, if it is warm at the same time, it is apt to occasion putrid disorders. The heat of the air dilates the fluids of the human body, and brings on sweats, which weaken and oppress. When, on the other hand, the air is too cold, the solids contract, and the fluids thicken, which causes obstructions and inflammations. The best air, therefore, is that which is rather heavy than light, neither too dry, nor too moist, and but little, or not at all mixed with noxious vapours——It is in the atmosphere that the clouds, the rain, snow, dew, thunder, and several ethereal phenomena are formed. It is to the atmosphere also that we owe the morning and evening twilights. As the rays break and bend in this mass of air, we see them before the sun appears, and we enjoy them after it has set. By this means those who live under the pole enjoy some ray of the sun in winter, even when

it is below the horizon. The atmosphere is the mansion of the winds, which have such influence on the fertility of the earth, and on the health of mankind. Cities and provinces would soon be unpeopled, and changed into melancholy desarts, if the air was constantly calm, and if there were not storms and tempests to purify it, and to disperse to a distance those noxious vapours which rise continually into the atmosphere.

Let us acknowledge, with gratitude, the wisdom and goodness of the Creator, who has regulated every thing in nature, so as to be most conducive to the happiness of the beings he has formed.

OCTOBER XVII.

PROPORTION BETWEEN BIRTHS, AND DEATHS.

THAT God has not left the life of man to a blind chance, but that he watches over us with paternal care, appears evidently in the exact proportion there has ever been at all times, and in all countries, among mankind, in respect to their entrance into the world, and their quitting it. By means of this balance, the earth is neither too empty, nor too full of inhabitants. "The number of those which are born, is generally greater than of those that die;" for it is calculated, that for ten who die annually, there are twelve or thirteen born. Thus, the human kind

continually multiplies. If it was otherwise; if the number of deaths exceeded that of the births, a country must of course be unpeopled at the end of a few centuries; particularly as many obstacles may prevent population, such as the plague, war, famine, celibacy, and lastly cities, especially those that are most populous, for in them there dies at least as many as are born. It appears from the christening registers, that there are "more boys than girls born." The proportion is generally from twenty to twenty-one; so that to a thousand female children, there are a thousand and fifty males. But the equality between the sexes is restored by deaths in the military way, and by many other accidents. There are generally more women than men in cities, and the contrary in the country. The number of children in families is also regulated with great wisdom. It is computed that in sixty-six families there are but ten children baptized in a year. In a populous country, out of fifty or fifty-four persons, there is but one married every year; and each marriage, one with another, produces four children; but in cities, we generally reckon but twenty-five children from ten marriages. A fourth part of every country is composed of men fit to bear arms. In comparing the bills of mortality in different countries, it is found that in common years, that is to say, when there has been no epidemic disorder, there dies one out of forty in villages; one out of thirty-two in little towns; one out of twenty-eight in middling towns;

one out of twenty-four in populous cities; one out of thirty-six in a whole province. For a thousand that live, there annually die twenty-eight. Out of a hundred children that die in a year, there are always three that come dead into the world; and there is scarce one out of two hundred that dies in the birth. They compute but one woman out of an hundred and fifteen dies in child-bed; and but one out of four hundred that dies in labour pains. The time of the greatest mortality with children is in the first year. There generally dies two hundred and ninety-three out of a thousand, at that age. But between their first and second year there die only eighty. In their thirteenth, fourteenth, and fifteenth year, the number of deaths never amounts to more than two. This then is the least dangerous period of life. Some learned persons have remarked, that there are more women than men who live to seventy or ninety; but that there are more men than women that go beyond ninety, and live to an hundred years. Three thousand millions of people at least might live at the same time on this earth; but there is scarce a third of the number, or at most a thousand and eighty millions; that is to say, six hundred and fifty millions in Asia, an hundred and fifty millions in Africa, an hundred and fifty millions in America, and an hundred and thirty millions in Europe. Is it possible that such an equality of births and deaths should be preserved, and their proportion

continue so regular and constant at all times, and in all places, if divine Wisdom had not so ordained it?

OCTOBER XVIII.

THE DISASTERS INCIDENTAL TO NATURE.

WE may observe that even this beautiful nature, which in spring charmed every sense, and afforded such variety of pleasure, is subject to the laws common to all created things. Its beauty has now disappeared, and each day brings new revolutions, one more melancholy than another. But such is the lot of nature. It contains within itself the sources of cruel devastations. How much mischief is occasioned by the overflowing of rivers, by heavy rains, the melting of snow and ice: Whole villages overflowed, fruit-trees torn up by the roots, crops of corn laid under water, flocks destroyed. All these are sad monuments of the destructive power of the elements. A shipwreck appears to be a less fatal disaster; but a whole nation might have been produced from the men that the sea has swallowed up. Immense sums (which required ages to collect) are lost in a moment. Whole families are ruined by one shipwreck. The very sight of the stormy sea, the lamentable cries of the dying people, the crash of the ship when it splits, what terror must it not strike?—What calamities proceed also from excessive heat and long drought? the

grasses and the plants wither, the earth is dried up, and we are stifled with the burning sand. The waters gradually corrupt, and become a poison to the flocks. Heat and putrefaction likewise breed swarms of insects. They destroy every thing, they devour the country; and, if they die to-day, another generation appears to-morrow. The horrid companion of death (famine) comes next, and is followed by the plague. One single bad year, a war, an infectious disorder, may cause all these evils.—What confusion, what destruction the earthquakes occasion, which become more and more common! In the very bowels of the earth pestilential vapours boil up, and a destructive fire spreads death on every side. Often on a sudden, in the middle of the night, the earth rumbles and quakes, whole cities are overthrown, and thousands of people are swallowed up.—What a formidable sight is a volcano! Nature, which in other respects is so lovely, here becomes terrible. At this dreadful scene, we may say, How imperfect is every thing but the Creator himself! Many people make nature their God, and its beauties make them forget the great Being from whence they proceed. Let us learn the true state of all earthly things, and how much superior the love of God is to all that can attach us here. To find delight in the contemplation of his divine attributes, and to know our sovereign good, is the way to triumph over all the desolations of nature. What is more proper also to increase our

love and gratitude, than to remember, that he turns even these calamities into blessings? These apparent disorders of nature prevent evils infinitely worse, which would happen if destructive matter, such as subterraneous fires and vapours were to remain heaped up and confined in the bowels of the earth. Volcanos and inundations preserve us often from the greatest calamities. Burning heats serve to dry the earth, which is in other parts overflowed with water. The extraordinary mortality which sometimes happens amongst men, is a very wise means of preserving the balance, and of preventing too great population. When we are mere spectators of the mischiefs that happen, and not immediately interested in them, ought not our gratitude to that great Being who has spared us, to be attended with sentiments of compassion and charity towards our unfortunate fellow-creatures? Let us never be insensible to the misfortunes of others, nor hear with indifference the calamities of people the most remote from us; as if nothing was to affect us but what related personally to us. In the immense chain of events in the world, there is not a single link to which we do not each of us belong more or less nearly.

To destroy and to create, such is, and ever will be, the work of God to the end of time. If he never destroyed, we should have no trials for resignation or patience. We should not be so sensible of the value of religion, which strength-

ens and consoles in the worst calamities, and which raises us above all the evils of life. Let this be the result of all our reflections.

OCTOBER XIX.

THE CIRCULATION OF THE BLOOD.

OF all the movements in the animal body, there is none more important nor more mysterious than the circulation of the blood. There is something so great in this motion, that it strikes the mind, and makes us sensibly feel the limits of human knowledge, while it inspires us with the profoundest admiration for the supreme wisdom of our divine Creator. The blood circulates continually in our body. Let us trace the principle of this motion. The heart which is placed near the middle of the chest, between the two lungs, is a musculous intestine, which forms two cavities, separated from each other by a partition. This machine is in continual motion, contracting and dilating by turns. From the left ventricle of the heart grows out the trunk of an artery, called the *aorta*, or the great artery. It soon divides into several branches, some descending, and others ascending. These numberless branches, which become smaller and finer in proportion as they are farther removed from the heart, spread, and are dispersed over every part of the body. The right ventricle, by contracting, pushes the blood into these arteries with so

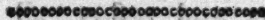
much force, that it reaches to the extremities of the very smallest and farthest branches. This motion is called the pulse. It is the effect of the pulsation of the heart, and is quicker or slower, according as the heart contracts with more or less quickness. But, what becomes of the blood when it has reached the farthest branches of the arteries, which are spread throughout the whole body? Nature makes the wisest use of it. Certain arteries through which the blood flows, absorb the watery parts, others the oily, and others still the saline particles. In different parts of the body, where the arteries reach, the secretion is formed of the milk, fat, or any other humour necessary for certain purposes, or which as useless, ought to be expelled from the body. The remainder of the blood, after being thus purged, flows into the extremities of the arteries in such a manner, that, with the help of a microscope, the little red globules may be seen very distinctly rolling one after another. But then, these little channels enlarge gradually, larger vessels form, and then larger still, called veins, through which the blood is conveyed back to the heart, in the same way as it had been conveyed from it, through the arteries. These veins then bring back the blood from all parts of the body, above and below, into the heart, where they form a channel, through which the blood again discharges itself into the right ventricle; from thence it does not go at once into the left ventricle, but the contraction of the heart forces it into the artery

which leads to the lungs, through a number of little branches. Here, the blood, which has circulated through the whole body, and is heated by the friction, requires, before it begins circulating again, to be cooled by the fresh air, which breathing conveys to the lungs. By means of this cooling, it thickens again, whereas it had been extremely dilated by heat, during the circulation: It is afterwards taken up by the pulmonary veins, which lead it to the left ventricle, which, by contracting, forces it again into the aorta, and thus it is dispersed throughout the whole body. In this manner, the blood circulates, passing from the heart to the extremities of the body through the arteries, and returning back to the heart through the veins. Such is the admirable mechanism of the circulation of blood, the most known to us, but much of it still remains obscure. We find wonders in it, which make us feel that the human mind cannot perfectly explain this master-piece of divine wisdom. For example, is it not wonderful that the motion of the heart should continue without interruption for seventy, eighty, or an hundred years, and that so delicate a machine should not fall to pieces, or wear out? The blood takes its course of circulation 24 times in an hour, and consequently 576 times in twenty-four hours; and as, at each pulsation, the heart forces two ounces of blood into the aorta, consequently, it appears that in an hour, there passes through the heart 7200 ounces, which is 600 pounds of blood.

Must not that alone strike us with astonishment? How many other extraordinary circumstances may there be in this circulation which we are ignorant of? In a word, "Man, to whose sway
" all things here below yield, is a wonderful
" composition. The most admirable mecha-
" nism and bodily perfection unite in him. Every
" limb proclaims him lord of the creation. An
" innumerable multitude of invisible chanel,
" formed and measured in a manner infinitely
" surpassing the art and skill of man, convey,
" disperse, and cause to flow regularly, and with-
" out interruption, this precious fluid on which
" life depends. In this universal motion, in this
" continual flux and reflux, all is regular and
" well ordered; every thing is in its place, and
" in the most perfect harmony; nothing is dis-
" cordant; nothing is in the way; nothing in-
" terrupts, nothing precipitates its course."
This admirable circulation, which is observed in all animals, takes place also throughout all nature. The sun, moon, and stars, run the course prescribed to them, in a regular determined motion. There is also a constant circulation in the elements; Not only the air is in a perpetual motion, but it circulates round the earth continually, and the water also flows without interruption. The rivers fall into the sea, and from the vast surface of the ocean rise vapours, which form into clouds. These spread again in rains, which penetrate into the mountains, fill the springs with water, which insensibly increase and become

rivers ; and then return again to swell the ocean. The ever fruitful earth annually produces plants and corn, yet never exhausts, because the continual circulation of nutritive juices repairs its losses, and restores to her what she had given to us.

All these revolutions of nature lead us back to a first Cause, who has so regulated the world, that every Being is continually in action. They circulate, act, and move in an insensible labyrinth of changes, till they return to their former place, and begin again the course prescribed them.



OCTOBER XX.

PROPORTIONS OF DIFFERENT PARTS OF
THE HUMAN BODY.

GOD has formed the human body according to the wisest plan, and has observed the most exact proportions in every part of it. To be convinced of this, we need only calculate the height and breadth of the human body by a certain measure agreed upon. The height of our body is generally divided into ten equal parts, which we call *faces* according to the terms of art ; because a man's face was the first model for those measures. The first takes in all the face, which begins at the root of the hair above the forehead. From that point to the top of the

head there is a third of a face in height; or which is the same thing, a length equal to that of the nose. Thus, from the crown of the head to the bottom of the chin, there is a face and a third of a face in length. Between the bottom of the chin and the hollow of the collar bones, there are two thirds of a face. Thus, the height from the collar bones to the crown of the head, makes twice the length of the face; which is the fifth part of the whole length of the body. From the collar bones to the bottom of the breasts, is reckoned another face. Below the breasts begins the fourth face, which ends at the navel; and the fifth face makes out half of the height of man. The length of the thigh to the knee, is that of two faces; and the knee itself is half a face. The leg, from below the knee to the instep, is the length of two faces; which in all make up nine and an half; and from the instep to the sole of the foot, being half a face, it completes the ten faces into which the human height is divided. This is meant for the generality of men; but in those who are very tall, there is about half a face more between the breasts and the middle. It is this degree more of height in that part of the body, which constitutes a fine stature. When the arms are stretched out in a direct horizontal line, the distance between the extremities of the longest finger of each hand is equal to the height of the body. From the hollow between the collar bones, to the joint which unites the shoulder-bone to the arm, there is the

length of a face. When the arm hangs down, it is computed at four faces. Two from the shoulder-joint to the elbow, and two from the elbow to the beginning of the little finger, which makes out five faces for each arm; in all ten faces, which is the length of the whole body. The hand is the length of a face. The thumb is the third of one, or the length of a nose, as well as the longest toe. The length of the bottom of the foot is equal to a sixth part of the height of the whole body. There is a measure also for the thickness of the body and limbs: That of the finger is generally the thirty-sixth part of the length. The thickness of the little finger makes the forty-eighth part. The hand is three times as thick as the thumb; and the body six times as thick as the hand. The height of the human body varies considerably. The finest stature is from five feet four or five inches, to five feet eight or nine inches. Middle size is from five feet and an inch, to five feet four. Low size is under five feet. Women are generally two or three inches lower than men. Their chest is higher; so that the size of the chest is thicker in women and broader in men, proportionably to the rest of the body. The women's hips also are larger; because the hip-bones, and those which join them and compose what we call the basin, are much larger than in men. Men have more brains than any other animal of the same size; they have even more than the horse or ox. A man who weighs an hundred pounds has general-

ly four pounds of brains. Children born at the proper time generally weigh eight pounds at most, and five at least. The greatest length is a foot and eleven inches; and the least is a foot and six inches. The human body then, whether it be taken in the whole, or in its several parts, is formed by exact rules. All is in proportion, and in the most perfect harmony, as well as to size and form, as in respect to the dispositions of the parts. There are none greater or smaller than the connection they have with the other limbs, or the general design of the whole machine require. No form or position could be imagined better adapted, or more advantageous to the limbs altogether. It is certain, however, that there may be variations and exceptions among them, which do not destroy the principal design of the body, such as monsters, and ill-shaped persons. But though certain disproportions in the size the form and position of the parts, may be compatible with the chief purpose of them, they still hurt the grace and beauty of the outward appearance. How grateful then should those persons be who are well made, and whose limbs are all well proportioned!

TO a thinking mind navigation is an object which may give rise to most important reflections. Here our curiosity is excited, and at the same time satisfied in several ways, so as to be a source of great pleasure. In general, we only consider the advantages which result from navigation, but we ought to consider also the mechanism and motion of ships, by which it is performed. Is it not, in the first place, very astonishing, that so enormous or heavy a mass as a ship should be made to swim on water? The weight of a ship is greater than may be imagined, and requires but little attention to comprehend, that its pressure on the water must be prodigious.—A man of war with a thousand men, ship's crew, must have generally three month's provision for that multitude of people, and is a seventy or an hundred gun ship. Now, in supposing each man to weigh but an hundred pounds, and a gun but six stone, though there are some that weigh forty, and supposing each man to eat but three pounds weight a day, even this moderate calculation amounts to a weight of 381200 pounds. Still the weight of the ship itself is not taken in, with its rigging, and the quantity of materials necessary to keep up the ship, and to load the guns; articles which at least equal the former in weight. Yet this enormous mass of 600,000 pounds weight is moved by a very gentle wind.

Is not this inconceivable? and does it not seem contrary to the laws of nature? But it is so natural, that it would be a miracle were it otherwise. It is the wind which moves this load. The ship swims with all its weight upon the water. But how such a heavy body can float, how the water, the parts of which do not hold to one another, can have force and consistency enough to support such a mass is the question. This is an effect of equilibrium. The ship sinks till the volume of water which it removes is equal to its own bulk. Suppose the ship 120 feet long and 15 broad, and that it sinks two feet deep, that is 2600 feet of water (or so much cargo), as one takes place of the other. Thus the river is no more loaded by the ship than it was by the water it removes.—Navigation was formerly much more dangerous and difficult than it is at present. They did not dare to venture far upon the open sea, but coasted along from shore to shore. But since the invention of the compass they cross the seas more securely. Before this valuable discovery it was a sort of a wonder to make little sea voyages. In the time of Homer it required great preparations and much deliberation before the heroes resolved to cross the *Ægean* sea. The expedition of Jason and the Argonauts, that is to say, the passage over the Propontis and Pont Euxine, was considered as a wonderful exploit. And what was it in comparison of our navigations? It is the discovery of the compass which has enabled us to make long

voyages. The needle turning constantly to the north, informs the navigator in what region he is, and to what coast he sails. In the darkest nights, in the most cloudy days, in the midst of the ocean, this instrument serves as a guide and leads him from one end of the world to another.

Though many may not have reflected on the advantages of navigation, it is to that we owe, directly or indirectly, great part of what is necessary for our subsistence. Species and medicaments which come from distant countries, we could not have without an enormous expense and difficulty if they were not brought in ships to our ports. The following circulation will prove it. A ship's burden is reckoned by tons. There are many which carry 600 tons. A ton weights 2000 pounds. Thus, a ship with a burden of 600 tons carries 1200,000 pounds weight. Now, allowing 1000 pounds to each horse, it would require 312 carriages for four horses, at least as many men, and 1248 horses, to bring over that weight. But then, how could treasures from other parts of the world be obtained? How much would even the common necessities of life cost?

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OCTOBER XXII.

BEASTS OF BURDEN.

THESE sort of animals do us so much service, and are so useful to us, that it would be

ungrateful not to examine them nearly. We generally content ourselves with subduing them for our food, or to supply our want of strength, whilst through indolence or ignorance we neglect to consider them as connected with the whole creation, or to reflect on the wisdom and goodness of the Creator, which appear so evidently in the production of these useful creatures. Of all domestic animals it is the horse which does us most service, and does it the most willingly. He lets himself be employed to cultivate our ground; he brings us all our necessaries, he submits tamely to every sort of labour, for a frugal and moderate subsistence. He shares with us the pleasures of hunting, and the dangers of war. It is a creature which gives up its being to exist only by another's will: he even knows how to prevent it: and, by the quickness and precision of his motions, expresses it, and executes it. Giving himself up intirely to his master he refuses him nothing; makes use of all his strength, exhausts himself, and even dies in trying to do more. Nature has given the horse a propensity to love and fear mankind; and made it very sensible to the carasses which render its servitude pleasing. The horse is the best proportioned and finest shaped of all animals. Every part of him is elegant and regular. The exact proportions of his head give him a light and lively look, which is still heightened by the beauty of his chest. His carriage is noble, his step majestic, and every limb seems to mark animation, strength, cour-

age, and pride.—The ox has not the pleasing elegance of the horse: its monstrous head, its legs, too thin and too short for the size of the body, the smallness of its ears, its stupid look and heavy walk, are deformities; but it compensates for these by the important services it does to mankind. It is strong enough to carry heavy loads, and is content with poor food. Every part of this animal is useful. Its blood, its hide, flesh, fat, and horns, may be applied to several uses. Even its dung we employ; it is excellent manure for the ground. A very remarkable circumstance in this animal is the construction of its organs of digestion: It has four stomachs, the first of which can contain forty or fifty pounds of food. The third stomach has eighty eight folds or ridges, which serve to digest, whilst sheep or goats have but thirty six.—The ass, however void of beauty in its appearance, and however despised it may be, has, notwithstanding, many excellent qualities, and is very useful to us. It is not fiery and impetuous like the horse; but quiet, simple, and always the same. It has no pride. It goes smoothly on. It carries its load without noise and murmur. It is temperate, both as to the quantity and quality of its food. It is contented with thistles and the hardest and worst herbs. It is patient, vigorous, and indefatigable; and is of continual and essential use to its master.

How is it possible that we can daily make use of these animals, without reflecting on the Creator who formed and gave them the means of being

so useful to us? It is a circumstance worthy the attention of a reflecting mind, that the number of beasts of burden is infinitely greater than that of wild beasts. If the latter multiplied as fast as the former, the world would soon be a desert. Can we reflect without gratitude on the goodness of God, who has given us the command of those animals; the strength or skill to subdue them, the right to make use of them; to change as we please their nature; to force them to obedience; and to employ them as we chuse. This power is a gift from God, by which man may every instant perceive the excellence of his being. If God had not impressed animals with a natural fear of mankind, it would be impossible to subdue them by force. Since, therefore, it is to him alone we owe our power over them, we should be unpardonable to abuse it, by treating those creatures ill.

OCTOBER XXIII.

THE WINTER SOWING TIME.

GREAT part of the food destined for us, and for many animals, is at this time deposited in the ground. The farmer has sowed his winter corn, and begins to enjoy rest from his labours. He will soon have the satisfaction to see his fields gradually covering with a beautiful verdure, and giving the promise of a plentiful harvest. Nature at first, indeed, works in secret, while the seed is opening, but its operations may be discovered,

by taking some of the grains out of the ground, when they are begining to shoot. Two days after the grain is put into the earth, it is swelled by the juices, and begins to shoot. The shoot is always at one of the ends of the grain; and that part of it, which is next the outside of the grain is the little root of the future plant. The part turned inwards is the stalk and head of the plant. The corn, when sowed, generally begins in twenty four hours to pierce through the coat, and unfold itself. The root and stalk become visible. The root is first wrapped up in a bag, which it bursts open. Some days after, other roots shoot out of the sides. The fifth or sixth day, a green stalk springs up above the ground. It remains some time in that state, till the fine season comes, when the ear of corn breaks out of the coats in which it had been inclosed, to protect it from cold and uncertain weather.

All this naturally leads us to reflect on the nature of human life. Our present existence is but the seed from whence everlasting life is to spring. We are here in the sowing season, and we see but little as yet sprung forth. We cannot here behold the fruit in maturity or the corn in perfection. The harvest will not be reaped on earth. We live in hope. The farmer has sowed his field. He leaves his grain to corruption, to the rain, the storms, and the heat of the sun, and he sees not what will be the result. This is precisely our situation in regard to spiritual seed. Let us not be vain of what we sow, neither let

us be discouraged, if we do not reap the fruits of it. Let us not be weary of "sowing to the Spirit;" and our good works, however trifling in themselves, will have happy consequences hereafter.

OCTOBER XXIV.

THE PARTICULAR PROVIDENCE OF GOD.

IT would be a great misfortune for the world if there was any foundation for the opinion of unbelievers, that God's providence is only over the world in general, for the preservation of the whole species, but not over individuals. Would such a Being as the freethinkers suppose him, deserve the name of God, if he could not, or would not, interest himself in the parts of which the whole is composed? For our comfort, we are taught both by reason and religion, to believe in a God whose providence extends to every individual creature. Let it not be said, that it is beneath him to attend to individuals. The whole universe, like the vilest dust, is nothing in comparison of the supreme Being. What then can we call little or contemptible? Is there not less difference between one single man and whole nations, than there is between them and these immense globes which appear so little in the eyes of the common people? The least reflection may convince us, that in the sight of God, to whom a

thousand years are as a day, and the whole universe like a drop of water in the sea, there is nothing either great or small in itself, or any event, however inconsiderable, that is unworthy his attention. If we take the poorest plant, or the least insect that can be dissected, we shall discover in the minutest parts of them the same wisdom as in the construction of the whole. The smallest fibre contributes as much to the perfection of the plant, as the animal or plant itself contributes to the perfection of the whole species, or the species to the perfection of the universe. But if God has vouchsafed to form these creatures which appear so despicable, why should it be beneath him to preserve them? And how could the whole be perfect, if the parts were not so; or how could a whole species be preserved, if the individuals were not regarded? Reason alone may teach us this, but revelation confirms it. We learn from thence, that the hairs of our head are numbered. Even our hairs, of which we lose millions in the course of our lives, without missing them, every one of them is numbered. From thence our Saviour draws this conclusion, that with much more reason God interests himself in us, and vouchsafes to honour us with his notice. Let us then adore his providence with the most lively gratitude and faith.

OCTOBER XXV.

THE MEASURE AND DIVISION OF TIME.

TIME is measured and divided according to the motions of the celestial bodies, and particularly by those of the sun and moon. Those two globes have the most influence on the state of mankind. The courses of the moon only serves to measure the time on our earth; that of the sun certainly regulates the time in all the planets which move round it. *Day* is the space of time in which the sun makes a revolution round the earth; or, to speak more justly, it is the time our earth takes in turning round its own axis. The part of this time, during which the sun is above the horizon, we call *artificial day*. This is when the lights is determined by sun-set and sun-rise. The time of darkness, or when the sun is below the horizon, we call *night*. the day and night together make the *solar day*. We divide it into 24 parts called *hours*. Each hour is divided into 60 equal parts called *minutes*; each minute into 60 *seconds*; and each second into 60 *thirds*. This division of the day into hours, minutes, &c. is marked by the motion of the shadow on a sundial, or by the hand of a clock. A good sundial constantly marks the hour truly, but clocks or watches require to be often regulated. Most Europeans in common life begin their hours of the day at noon, from whence they reckon twelve to midnight, and twelve more to noon again.

The Italians begin the day at sun-set, and reckon twenty four hours from thence to the following evening. The turks begin their day at a quarter of an hour after sun-set; they reckon from thence twelve equal hours, and, when those are passed, they reckon twelve more to the following evening. The Jews begin the day at sun-set; from thence they reckon twelve equal hours to sun-rise, and as many to sun-set, consequently, their hours of the day are longer or shorter than those of night, in proportion to the length of the day and night. A week is the space of seven days. A solar month is the time the sun takes in traversing a sign of the zodiac: But those months do not begin or end exactly as that body enters a new sign. The lunar month is the space of time between two new moons, that is to say, 29 days, 12 hours, and 44 minutes. The solar year takes in 12 solar months, which is the time the sun takes in traversing the 12 signs of the zodiac; and there are generally reckoned in that time, 365 days, 5 hours, and 40 minutes. These are now the years in most parts of Europe. The lunar year takes in 12 lunar months, or twelve courses of the moon round the earth. It is composed of 354 days, 8 hours, and 48 minutes. The Jews and Turks make use of this reckoning; but, in order to make it answer to the solar-year, they often add a whole month to it. Our common years begins 10 or 12 days after the sun has entered Capricorn.

This measure or division of time, however unimportant it may appear in itself, may become of much consequence, by the application of it to the moral life of man. The hours, days, weeks, months, and years, of which our earthly life is composed, were given us, in order that we should fulfil the desire of our existence, by making a good use of our faculties. But how do we employ this precious time ! Minutes appear to us too trifling to attend to. It is certain, however, that he who does not reckon minutes will lavish hours also. But, are we even mindful of more considerable spaces of time ? Alas ! if, out of all the days allotted to us, we were to deduct those which are almost lost to us, in respect to our immortal soul, what would there be left ? From this calculation may we not reckon that a man of seventy has lost more than fifty years, and that one of fifty could scarce reckon seven which he has employed for his eternal happiness ?

What a melancholy mortifying thought is this ! How many millions of days and hours granted us by Divine goodness, have been shamefully consumed in idleness and vice, in giving way to criminal passions, and in doing injuries to our fellow creatures ! With what inconceivable rapidity does time pass away ! An hour is irrecoverably lost, ere we perceive it ; and an hour is a great deal to Man, who may easily reckon the hours of his life. “ Teach us, O Lord, so to number our days, that we may apply our hearts
“ unto wisdom.”

OCTOBER XXVI.

THE END OF SUMMER.

THE sun is now taking leave of the world. Every thing is changed with us. the earth, which was lately so beautiful and fruitful, is now becoming gradually barren and poor. We no longer behold that fine enamel of the trees in blossom; the charms of spring; the magnificence of summer; those different tints and shades of verdure in the woods and meads; the purple grapes; nor the golden harvests which crowned our fields. The trees have lost their clothing; the pines, the elms, and oaks bend with the force of the northern blasts. The rays of the sun are too feeble now to warm the atmosphere or earth. The fields which have bestowed so much upon us, are at last exhausted and promise no more this year. These melancholy changes must necessarily diminish our pleasures. When the earth has lost its beautiful verdure, its lively colours, its brilliancy, and in a manner all its glory; when the fields present nothing but a damp soil and gloomy colours, we lose the pleasures attending the sense of sight. When the earth is stripped of its corn, its grass, and its leaves, nothing is to be seen but a rough and rugged surface. It has no longer that beautiful appearance which, the whole together, of corn, greens, and herbs, produces over a vast country. The birds no longer sing; nothing now recalls to the mind of man

that universal joy which reigned throughout all animated nature. Deprived of the pleasure which the melodious songs of the birds afforded, he hears nothing now but the murmuring streams and whistling winds. Constantly the same dull sounds which can only create disagreeable sensations. The fields have lost their perfume; and nothing is breathed but a sort of damp smell, which is never pleasing. A cold damp air is disagreeable to the feeling, consequently nothing remains to flatter our senses. But in the midst of these melancholy prospects, let us still observe that nature faithfully fulfils the eternal law prescribed to her, of being useful at all times and seasons of the year. Winter draws nigh; the flowers are going; and even when the sun shines, the earth no longer appears with its usual beauty. Yet the country, stripped and desert as it is, still presents to a feeling mind the image of happiness. We may recollect with gratitude to Heaven, that the fields which are now barren, were once covered with corn and a plentiful harvest. It is true, that the orchards and gardens are now stripped, but the remembrance of what they bestowed upon us, may make us content to bear the northern blasts which at present we feel so sharp. The leaves are fallen from the fruit-trees; the grass of the field is withered; the dark clouds fill the sky, and fall in heavy rains. The unthinking man complains at this, but the wise man beholds the earth moistened with rain; and beholds it with a sweet satisfaction. The dried leaves and the faded grass,

are prepared by the autumnal rains to form manure to enrich the ground. This reflection, with the pleasing expectation of Spring, must naturally excite our gratitude for the tender mercies of our Creator. Though the earth has lost its beauty and exterior charms, and is exposed to the murmurs of those it has nourished and cheered, it has already begun again to labour secretly within its bosom for their future welfare. But why is not the moral world equally faithful to fulfil its destination as the natural world? The acorn always produces an oak; and the vine produces grapes; why then do not the children of a great man always resemble him? The man of learning, and the artist so useful to society, why are their descendents so often stupid and ignorant? Why do virtuous parents produce wicked and bad children? In reflecting on this difference we may find several natural causes for it; and we may see that it must happen in the moral, as it does sometimes in the natural world. The best vine for want of a good temperature, produces sour, bad grapes; and parents respectable for their virtues have children that degenerate from them. Perhaps our lot in this world has its seasons; if it be so, let us in the dull winter of life have recourse to the provisions laid up in the days of prosperity; and endeavour to make a good use of the fruits of our education and experience. Happy, if at the close of life, we carry with us to the grave the merit of having been useful to society.

OCTOBER XXVII.

MAGNIFICENCE OF GOD IN THE WORKS
OF THE CREATION.

“**GOD** has shewn himself in the creation as “ a Being infinitely wise.” There is no creature however insignificant it may appear, that has not its use ; and all of them are formed in the manner best adapted to the purpose of their existence. This we know with certainty of those we are acquainted with, and we may conclude the same of the rest by analogy. From the sun, down to the lowest worm, or smallest plant, we shall every where find, that, for the purpose designed by the Creator, no creature could be formed otherwise than it is. The most minute parts of each creature are evidently adapted to its use, and serve for the functions prescribed them ; and the whole creature would be defective, if any one of its parts were hurt or taken away. How wonderful is the whole which results from the connection between all creatures in general ! Each is in its place ; each has its proper office, and none of these could fail without causing an imperfection more or less in the whole. When, therefore, we represent to ourselves the Being who formed this innumerable multitude of creatures animate and inanimate ; who has not only designed each of them for certain purposes, but has disposed and arranged every part of them in the manner best adapted to those purposes, so

that there is nothing superfluous or wanting ; who has, from the connection between each individual, formed an admirable whole, in which there reigns the most perfect harmony; must we not be struck with astonishment, and cry out with respectful admiration, " O the depth of the wisdom and knowledge of God ! "

" In the creation God has shewn himself a " Being infinitely good." He has every where given life, motion, and existence. What multitudes of animated creatures has his beneficent hand produced ! From the beginning of the world, mankind have been endeavouring to find out all the living beings on earth, and yet they daily discovered new species of them hitherto unknown. Is not life invaluable to every thing that breathes ? Is it not a blessing to the poorest worm ? What pleasure God has in doing good, appears by the number of creatures on whom he has bestowed the blessing of existence. But of what use would their existence be, if they were to be immediately deprived of it ? The Creator has therefore ordained, that each should live as long as was necessary for its destination. He has appointed to each creature the place it should inhabit, and each of them finds at its birth all it requires for the preservation of its existence.—Many animals are born with instinct and industry sufficient to seek their own food ; others, like mankind, are at first taken care of and taught by their parents. How inexhaustibly fruitful has God made the earth for the benefit of mankind ! How

long already has it afforded support for millions of men and animals! And were the world to subsist ever so long, there is no doubt it would continue to do so for all the future generations. How many enjoyments and pleasing sensations does not the Creator grant with life to all animated beings, and particularly to mankind! With what magnificence has he not adorned and embellished the world which man was to inhabit! What sweets does not social life afford him? What tender ties, what warm affections, what delightful sentiments has he created for the heart to enjoy! Let us never be ungrateful to such a bountiful Creator; and, since we are endowed with reason, and are capable of knowing and loving God, let us acknowledge with transports of joy, that "the earth is full of his mercies."

"In the creation God has shewn himself as a "Being of infinite power." This unlimited power, which is visible in all creatures, is particularly so in the two extremes, in the greatest and in the most minute works of the universe. What but an almighty hand could form the firmament, that immense extent, that prodigious space, which contains such a number of celestial bodies? Who but he could preserve this immense fabric, fix it unshaken, and yet keep up so many different, though regular movements in it? What other could raise the sun to such a height, appoint its situation so as not to deviate from it, and maintain it unsupported in that vast expanse? Could any but an almighty power give

motion to the earth, the moon, and stars, so as to run invariably the course prescribed them, to finish and begin again their revolutions at certain appointed periods? If we consider the divine Omnipotence in the smallest objects, we shall find it there as incomprehensible as in the largest. We need only cast our eyes on the dust under our feet. This dust is inhabited by an innumerable multitude of animals, so small that several millions of them joined together would not be equal to a grain of sand. Yet each of these animals has its exterior and interior parts; each has its sense and feeling, each has its instinct, loves life, and endeavours to preserve it. Behold the grass of the field, the hairs of your head, the blossoms of the trees, and study their construction, their origin, and use; we shall every where discover wonders; every where acknowledge the infinite power of him who forms celestial globes with as much ease as he creates a worm or causes a flower to grow.

How great and numerous are the works of God! They are full of wisdom, and the earth is filled with blessings. May these reflections excite in us the love, respect, and confidence, due to the wisest, best, and most mighty of Beings.

OCTOBER XXVIII.

LAWS OF INERTION.

INERTION is nothing but a force of resistance, by which all bodies are disposed to remain in the state they are in. When a body is at rest, it resists the motion given to it; but when once put in motion, it persists in it from the same cause, and resists the bodies which would stop its motion, with as much force as it at first resisted the moving powers. Nothing can be wiser than this law which the Creator has established. By this means the bodies move with perfect regularity; and the laws of motion and percussion can be exactly determined by it. If the celestial globes had not a force of resistance, they could not move with such order and regularity, but would constantly require a new motive to keep them in motion. It is an evident proof that the universe was formed and planned by infinite wisdom. Suppress but a little part of the immense fabric, and the whole would be out of order. Of what use to us would be the construction of plants and animals, or the admirable arrangement of the celestial globes, if those bodies were not susceptible of motion? How simple does this law appear, and yet what wonderful effects result from it! Such are all the works of the Creator. The principles are of the utmost simplicity, but the whole edifice is so much the more admirable. The universe is like a magnificent palace; the thick and rough walls on which the building rests,

appear to have neither elegance nor beauty, and yet they are so indispensably necessary, that without them, the least motion of the air would throw down the whole edifice. Even these foundation-walls are not totally void of beauty, though every one may not be capable of seeing it. One should be an architect himself, or be well acquainted with the rules of art, to be able to conceive the pleasure which the symmetry and construction of foundations may afford. None but an artist can know why these foundations are of the depth, width, and length, which the architect gave them. He sees they would not be right, if they were otherwise; and, by knowing how perfect the work is, he enjoys the satisfaction of being able to judge of it. This is exactly the case in contemplating the works of God. Every spectator is not capable of discovering the fundamental laws on which most of the phenomena depend, or of comprehending the wisdom of them. This knowledge is reserved for the true philosopher, and it affords him inexpressible pleasure. It seems as if there was also in the mind a certain inertia as well as in matter. Bodies which move constantly the same way, and towards the same point, have a certain tendency to it. The human mind has the same propensity to acts which are often repeated in the same manner. This makes it so difficult to root out certain habits. We might make an excellent use of this natural resisting power of the soul, by making it serve to strengthen us in virtue. Nothing is necessary for this

purpose but to repeat frequently the same acts, till we become as much accustomed to good and virtuous actions, as we are now to bad ones. It is of so much the more importance, as without virtue we can never enjoy true or solid tranquillity. But from whence proceed the errors into which we so often fall in this respect? Why do we continually pursue imaginary blessings, which lead us to destruction? Our hearts, seduced by the pride which is natural to us, and dazzled by the deceitful appearance of sensual things, make us enter the path of virtue with a sort of repugnance. But let us not be discouraged by the violence we are obliged to do to our inclinations and passions. The wicked themselves are often obliged to restrain theirs, in order to gain some temporal advantage, or to avoid some misfortune. And this constraint, in not yielding to their sensual desires, must be very painful to bad men. On the contrary, how sweet the satisfaction we feel, when our souls resume the command they ought always to have over the senses! A frequent exercise of this command would lead us at last to that happy state, wherein the soul is in a manner raised above the tumult of passions, and beholds with pity the swarm of despicable slaves to vice.

OCTOBER XXIX.

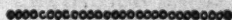
THE WANTS OF MAN.

THERE is not a creature on earth that has so many wants as man. We come into the world naked, ignorant, and destitute. Nature has not endowed us with that industry, and those instincts which the beasts have at their birth. Reason has been bestowed on us, that we should acquire the necessary knowledge and talents. In this respect the animals may appear enviable. Are they not in reality happy to have no occasion for the dress, the defence, and conveniences, which we cannot dispense with, and not to be obliged to invent, or put in use, such a multitude of arts and trades as these several necessities require? They bring with them at their birth, clothes, arms, and all they want, or they have those natural instincts, which, by following blindly, procure it for them. If they require habitations, they know how to dig or build them: if they want beds, covering, or change of clothes, they know how to spin and weave them, and get rid of their old ones; if they have enemies, they are provided with arms to defend themselves; if they are sick or wounded, they know where to find proper remedies. And we, who are so superior to other animals, have more wants and fewer means of supplying them than they have. It may be asked, why the Creator has, in these respects, given the brute creation the advantage over mankind? and this curiosity is very excusable, if it is not

attended with complaints. The divine wisdom appears in this, as in every thing else. By subjecting man to more wants, God designed to exercise that reason with which we were endowed, to render us happy, and which supplies all the resources of other animals. By not having their instinct to assist our many bodily wants, we are obliged to make use of our reason, in order to acquire a knowledge of the world and of ourselves. It is necessary to be active, vigilant, and laborious, to preserve us from poverty, pain, and vexation, and in order to make our lives pleasant and happy. Reason is, at the same time, the only means to subdue our strong passions, and to prevent us from running into excesses of pleasure, which might be fatal to us. A few examples may convince us of this. If we could obtain, without any trouble, all our food, &c. we should certainly become indolent and idle, and we should pass our lives in shameful sloth. The noblest faculties of man would weaken and grow dull. The bonds of society would be broken, because we should no longer depend on one another. Even children would be able to do without the assistance of their parents, and still less would they want it from others. All human kind would fall again into a state of barbarity. Wild and savage, every one would live, like the brutes, for themselves only. There would be no subordination, no mutual obligations or good offices. It is then to our wants that we owe the opening of our faculties, and the prerogatives of humanity. They awaken

the mind, create activity and industry, and make our lives more pleasant and easy than those of other animals. Our wants have made us sociable, rational, and regular in our manners; they have given rise to a multitude of useful arts and sciences. In general, an active and laborious life is beneficial and necessary to man. If his faculties and powers are not exercised, he becomes a load to himself, he falls gradually into a stupid ignorance, into gross excesses, and all the vices resulting from them. Labour, on the contrary, sets all the machine into a pleasing motion, and gives so much the more satisfaction and enjoyment, as it requires the more industry, reflection, understanding, and knowledge. Natural wants, therefore, on all accounts, were necessary to make us rational, wise, social, virtuous, and happy. If, after having been fed with our mother's milk, we required no assistance, or instruction, we should only live for ourselves, we should center all in self; learning no language, we should make no use of our reason. Stupid, and profoundly ignorant, we should neither be acquainted with the arts nor sciences, nor the noblest pleasures of the soul: Whereas, now, the wants of children, the destitute state in which they come into the world, oblige the parent, through pity and tenderness, to take care of them, whilst the children, on their parts, are attached to their parents, by a sense of their own helpless state and danger, and submit to be guided by their instruction and example, how to make a proper use of their reason, and to respect mo-

ality. Thus, they may become worthy men, good citizens, and lead a virtuous and happy life. With such advantages, we may easily give up those which the animals appear to have over us. We require neither furs nor feathers to clothe us, no teeth or claws to defend us, neither more cunning or natural instinct to procure us necessaries. Such gifts of nature would only degrade or reduce us to a mere animal state of perfection. Our senses, our reason, and our hands, are sufficient to procure us clothes, arms, food, and all we require for safety or pleasure, and enable us to enjoy all the treasures which nature bestows. We find, then, that these wants, of which so many complain, are the true foundations of our happiness, and the best means which divine wisdom and goodness could make use of, in order to direct the faculties of man to the greatest advantage. If we were wise enough to employ them according to these views, we should spare ourselves much misery. There are scarce one in an hundred, amongst the unhappy, who can attribute his distresses to fortune; and we ought to confess that there is much more good than evil in the world.



OCTOBER XXX.

ON PRESENTIMENT.

THE faculty of the soul in foreseeing future events appears in such extraordinary ways, that

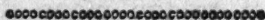
we cannot but be struck with it. The sensations and representations which produce a presentiment are sometimes so obscure and wrapped up in the mind, that we are not conscious of them. The mind, however, draws very exact consequences from them, and the image of the future presents itself clearly enough to convince the mind of it. It then forms conjectures and presages without knowing what led it to do so, and in it astonishment takes them for inspiration. This is what we call Presentiment; when, without being able to account for our foreseeing some future event, we have an idea more or less clear of it. But it must here be observed, that presentiments are by their nature much fainter representations than sensations, therefore they cannot be distinguished well when the senses and a warm imagination put the mind into a violent agitation. But, as soon as the soul is calm, the presentiments are more distinct, and this is the reason that they happen generally in the silence of night, in sleep, or in dreams. Man is then sometimes raised above himself; the veil is drawn from between him and futurity, without his knowing how it happens; and he speaks of future events, while he is scarce able to see what passes before his eyes.

A number of facts prove, beyond a doubt, that the soul has sometimes this faculty of foreseeing the future. One must be little versed in the knowledge of nature to deny a thing only because it appears extraordinary, and that we cannot explain it. This secret emotion which

sometimes warns us of what is to happen, really exists in the bottom of our souls; and history is full of so many examples of this nature, that it is impossible to deny them all. There are few people who have not experienced some of them. The soul is a representative power of the universe, in respect to the place it occupies in it. It has the faculty of representing the past as well as the present; why may it not, in the same manner, represent the future, and even future contingencies? It may use the same means for this purpose as it did in respect to the past. Provided it has been informed of past events, it can perceive them as if present; and why should we consider as impossible that it should be informed also of future events? There are in the universe millions of spirits superior to man, which might reveal to him some part of futurity; or there may be in the human mind some power hitherto unknown, which may enable it to foresee remote events.

But however obscure and inexplicable the causes of presentiment may be, it is enough for us to know, that they may contribute directly or indirectly to our happiness. Sometimes they warn us of danger, sometimes they foretel some pleasing and happy event. In either case these warnings may be useful to us. We are only to take care that this faculty of the soul, instead of being a torment to us, may serve to confirm and increase our tranquillity. We must particularly guard against superstition. We must not too

much trust to presentiments, so as to depend rashly upon them, or allow them to make us neglect our duties, or forget that it is in God alone we ought to put our whole trust and confidence.



OCTOBER XXXI.

THE HEAVENS DECLARE THE GLORY OF
GOD.

IF we wander in the paths of error and vice, it is certainly not for want of warning or instruction; for whosoever is so disposed may find continual opportunities for both. There is scarce any thing in the universe that is not calculated to inform or correct us. Every thing combines to give us a high idea of the God we adore. Every thing tells us the respect and obedience we owe him. All his creatures declare his power, his wisdom, and glory, in a language very intelligible to those who attend to it. The heavens in particular, and all the heavenly host; the sun, that great principle of fecundity and life, with eloquence proclaim, and loudly celebrate their divine Creator. These are objects truly worthy the observation of a rational being; and yet they seldom occupy our thoughts. Man, in a state of nature, could have no other guide in searching for his God, but what he drew from beholding the works of nature, and particularly the

structure of the heavens; yet from these alone, all nations formed this natural consequence, that there was a God. "When we behold the heavens, (says Cicero) when we contemplate the celestial bodies, can we fail of conviction; must we not acknowledge that there is a divinity, a perfect Being, a ruling intelligence which governs, a God who is every where, and directs all by his power? Any body who can doubt this, may as well deny there is a sun that lights us. Time, (says he in another place,) time destroys all false opinions, but it confirms those formed from nature. For this reason (with us as well as with other nations) the worship of the gods, and the holy exercises of religion increase and grow purer every day." This proves the effect which the contemplation of the heavenly bodies had at all times upon mankind. The royal Psalmist therefore might well speak of the heavens as having voice and language, for they forced all nations to acknowledge them the work of a supreme Being. "The heavens declare the glory of God." There are two ways of considering the Heavens and the firmament: the one general and superficial; the other more particular, and with attention. The first is common to all who are endowed with sight. They need only look up and behold the starry sky, with all its beauty and magnificence. The labourer in the field is witness to this admirable scene; and every day he hears the language of the heavens. Though he cannot know the wonderful construction of this

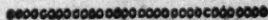
firmament which so attracts his sight, nor is able to make philosophical observations upon it, yet it may lead him to ask, "What power has formed this vast, this splendid sky? if it be solid, who is the architect? What hand suspended all those luminous bodies at several distances from it? and who directs them to move in regular courses?" Good sense alone would give rise to these questions; and the same good sense would be sufficient to resolve them. But (if one may dare to use the expression) the heavens have in latter ages been forced to speak a still more intelligible language. There has been extorted from them new demonstrations of the glory of God. I will point out only a few of the observations which modern philosophers have made on this important subject, as evident proofs that the heavens are the work of God. In the first place, the immense expanse astonishes and confounds the imagination. Formerly our idea of it was much more confined; but now that by comparing our earth to the stars, we have found it to be one of the smallest globes in the universe; and that the heavens contain millions much greater, judge what a space it requires to admit such a number of bodies (among which the sublunary world is but as a speck) so as to make their revolutions without interfering or hitting against one another. What idea does even this first observation give us of God's infinite power! How can we reflect on these vast regions without admiring the Being who fills them by their immensity, and

whose power extends to the remotest parts of the universe. Secondly, The innumerable bodies this great expanse contains, some of which shine with their own light, others only by a borrowed one. Without deciding any opinion in respect to the fixed stars being suns to light other worlds or not, it is enough for us to know that God has not made any thing in vain; and consequently all these bodies, both luminous and opaque, are designed for purposes worthy his wisdom. New ones are every day discovered, which had before escaped our limited sight; and of course were not created for us only, as it was formerly imagined. The works of the Creator are found to be so numerous, and in such variety, that it would be the height of human pride to suppose our earth the principal to which all the rest belong. Thirdly, the prodigious, and yet well ordered distance of the celestial bodies, joined to their reciprocal and regular effect upon one another at that distance, is a third source of admiration. If the universe had been the work of chance; if it had not even been formed by the wisest, as well as most mighty of Beings, there would have been confusion and irregularity in the plan; but he who measures infinite space with the palm of his hand, placed each globe in the only situation proper for it. The celestial bodies never interrupt each other's course, nor prevent the mutual effects of any. In a word, the most perfect harmony subsists between them. If we were only to consider that assemblage which we call our

vortex, we should there behold all the globes of which it is composed, beginning and ending their course at certain fixed and regular periods, without ever varying. Thou knowest it, O man! God causes the sun to rise each day. He dispenses the seasons. In the expectation of these vicissitudes thou art never deceived. What but a God could preside over so many wonders? Fourthly, in the motion also of the earth and celestial bodies, (considered simply as mere motion) we find demonstration of the existence and unlimited power of the Deity. In fact, as all these vast bodies do move, they must necessarily have been determined to it by some Being, By a first Motive. They are by nature inanimate bodies; and not having in themselves the principle of action, they must have received it from a superior Power. Besides, theirs are not motions directed by chance, they are constant, regular, and periodical, another sign consequently of a divine Hand. Lastly, Light and heat are two things which are absolutely necessary for us, and which we enjoy in proportion to our want of them. Plunged in eternal darkness, this world would have been a melancholy prison. Deprived of those rays which give life and fruitfulness to all the productions of nature, we should have been chilled with continual frost. One sun alone has power to animate and quicken the whole earth. In the day it lights us, and then gives place to the dark veil of night. During part of the year it draws near us in order to produce and ripen the

fruits which nourish us. During the other part it removes from us, to give time to the earth to rest. Were it nearer to us, it would set us on fire; were it farther from us, we should perish with cold. What compass is it that has measured so exactly? What supplies this globe of fire, so that none of its substance is wasted, but remains entire and unconsumed?

How forcibly does all declare the divine Almighty power!



NOVEMBER I.

CREATURES THAT LIVE IN THE SEA.

WE should, at first, have some difficulty in believing that there could be live creatures in the sea. It contains so many different sorts of plants, herbs, trees, and bushes, which so mix and twine together, that it seems as if the ways must be impassable, and that there could be nothing but disorder and confusion in this savage place: And yet, strange as it may appear at first sight, nothing is more true, than that there are living creatures in the sea, all connected with one another. It is not a few individuals only that the sea contains, but such a number of different species that we are far from knowing them all, much less can we say how many individuals belong to each species. In the midst of this innumerable multitude of animated beings, there is no confu-

sion ; they are easy to be distinguished ; and there reigns the same order in the sea as elsewhere. All those creatures may be ranked in certain classes ; they have their particular and distinct nature, food, way of life, character, and instincts. There is in the sea, as upon land, gradations, shades, and insensible steps from one species to another. The one begins where the other ends. The stone which is the highest among the minerals, is half of it a plant ; the plant, which terminates the vegetable kingdom, belongs partly to the animal ; and the brute, which forms the link between man and beast, has some conformity with man. So likewise, in the sea, nature goes gradually from small to great ; each species rises insensibly to perfection ; and the whole are connected by one immense chain, in which no link is wanting. What a prodigious multitude of inhabitants does the sea contain ! What variety amongst them, in their forms, their instinct, and destination ! Some are so small, they are scarce visible ; others are so large, that one is frightened at the sight of such enormous masses. There are some totally without any ornament, and so like the sea in colour, that they can scarce be distinguished from it ; nature has adorned others with the most lively and beautiful colours. Some species of them multiply very little, as they would otherwise destroy and devour all the others ; some, on the contrary, are wonderfully prolific, in order to serve as food for men and animals.

NOVEMBER II. 187

"O Lord! how manifold are thy works! In
"wisdom hast thou made them all."

NOVEMBER II.

THE WISDOM OF GOD IN THE CONNEC-
TION BETWEEN ALL THE DIFFERENT
PARTS OF NATURE.

AS all the members of the human body together form one whole, which is constructed and planned with infinite wisdom; so also the different species of natural productions are so many members of which the supreme Wisdom has composed one perfect whole. It requires but little attention to be convinced, that every thing in nature is linked together. It is evident that the several sorts of mineral earths, nourish and preserve the vegetables, without which the animals could not subsist. Fire, water, and air, are indispensably necessary for the preservation of this terrestrial world. This forms an indissoluble bond between all the Beings of which our globe is composed; and it has been demonstrated by naturalists, that this globe itself has necessary connections with the sun, the planets, and all the creation. But what less than boundless wisdom could combine together such infinite multitudes of different substances, and form them into one? What but that could link together so many millions of different creatures, in such a manner

that they should serve for the subsistence of each other. That we may not be lost in this immense ocean, the creation, let us only dwell on the subject of our globe, which makes so small a part of it. From the wisdom we shall discover in this, we may form a judgment of the whole universe. Let us at present only reflect on what we have before our eyes, and examine the animal kingdom in respect to its connection with the rest of nature; and if we consider the wants common to all animals, we cannot avoid being struck with the admirable harmony there is visible in it. Warmth, air, water, light, all these things are absolutely indispensable for the preservation of all creatures. But there must be a just proportion of them. The too much or too little would be equally hurtful, and would turn nature into chaos. A degree more in the universal heat would destroy every living creature. For if our earth, taken in the whole, should receive more of the sun's heat, the summer, in every climate must consequently be hotter than it is at present. Experience tells us, that in all countries the heats are sometimes so great, that if they were to increase, or to last longer, men and animals would die, and the plants would wither and perish. On the other hand, if we had less heat, it would be as bad, since even as it is, the cold is sometimes so severe, that animals are in danger of being frozen, and do often die of cold. The earth then receives the precise degree of the sun's heat which is proper for all creatures, and any

other would be fatal. There is the same just proportion in the air. The rising of the vapours depends chiefly on the weight of the air, and the rain on its lightness. Now, if the air was not to condense and to rarify by turns, and become sometimes heavier and sometimes lighter, we should not have the variety of temperature so necessary for the vegetation of plants, and consequently for the support of animals. If the air was in general heavier than it is, it would be more loaded with vapours, clouds and fogs, and from thence it would be wet, unwholesome, and hurtful to plants and animals. If, on the contrary, it was lighter, the vapours could not rise, nor collect into clouds. It is the same in every thing. Nature always observes a proper medium; and as all the elements are regulated in the manner best adapted for the preservation of animals, so are they in perfect harmony with all other natural things. The air not only produces those variations of temperature which are so essential, but is also the origin of sound. It has been appropriated to our ear; and here again appears an admirable wisdom. For if the air was more or less elastic, if it was more or less thick, the ear would suffer by it greatly. The soft and pleasing voice of man would resemble claps of thunder, or the hissing of serpents. The air contributes also to the circulation of the blood; it penetrates into the very smallest veins. If it was thicker, its force would break every thing; if it was thinner, it would act too feebly. There are a thou-

and other connections that different Beings have with the air, and yet it has all the properties which each requires. Now, if we consider that many millions of species of plants and animals have all of them occasion for air, heat, and light; that each species differs from the others, and has its peculiar constitution, that is weaker or stronger than others; and yet that the elements agree equally with all, and supply their different wants; shall we not acknowledge, that a boundless wisdom, to which nothing is difficult, must have formed this admirable connection and harmony between so many different Beings? In a word, every thing in nature is formed by exact rules, and designed for certain purposes. Not only the trees which rise so majestically, the plants so varied, the fertile meadow, the horse so useful to us, the flocks which feed us, the mines which supply us with ornaments and riches, the sea which furnishes our tables with exquisite fish, and conveys us from one region to another, the stars which shed their influence on our globe; not only these brilliant parts of the creation, but even the very moss, the little shell-fish and insects, contribute to the perfection of the whole.

Almighty Being! Creator and Preserver of all things! can we contemplate these objects without thinking of thee, and admiring thy wisdom? Without thee, all would be darkness, confusion, and disorder. There would be neither connection, harmony, nor pleasure, upon earth.

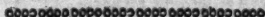
NOVEMBER III.

B E D.

PERHAPS we are not as sensible as we ought to be of the comfort of a bed in summer, but now that the cold increases every day, we begin to know the value of this blessing. If we were deprived of it in these cold nights, the perspiration would be stopped, our healths would suffer, and our sleep would neither be so sweet or refreshing. In this respect, bed is a considerable benefit to us. But, from whence comes the warmth we find in it? We should be mistaken, if we supposed it to be the bed which warms: So far from communicating heat to us, it is from us that it receives it. It only prevents the heat which evaporates from our body, from being wasted in the air. It confines and concentrates it. We should feel this blessing more sensibly, if we considered how many creatures must concur to procure it for us. How many animals furnish us with hair and feathers for the purpose? Supposing a common bed to contain 36 pounds of feathers, and that a goose should have but half a pound on its body, the spoils of 72 geese would be necessary for one single bed. And then, how many hands and materials does it not require? It is by these sort of calculations that we learn to know the value of God's blessings. We are apt, in general, to reflect very superficially on the gifts he bestows upon us; but if we examined into them

more minutely, we should see them in a very different light. Let us reflect, then, on the several parts of which a bed is composed, and we shall be astonished to find, that it requires the work of ten persons, at least ; that it costs the lives of as many animals ; that the fields must furnish flax for the sheets and blankets ; the forests supply the wood, &c. We may make the same reflections on the most common daily blessings. Our linen, clothes, bread, and drink, in a word, all the necessaries of life, none can be obtained, but by the concurrence and labour of many persons. Can we then lie down in bed, without grateful sentiments ? What sweet repose, what relief, after the fatigues of the day, do we find in bed ! In these cold nights, there is no warmth, not even with great fires, equal to that of bed. Warm rooms heat the head more than the feet, whereas the warmth of a bed is more equal and temperate : It gives us at little expence warmth and rest. Let us then be thankful whenever we lie down to sleep, and remember how valuable a blessing it is. We ought to be the more so, as there are but too many of our fellow creatures who have no beds to lie on. How much are they to be pitied ! How many are there exposed, in open air, to the inclemency of the weather, travelling by sea or land ! How many in prison, or in poor huts, sighing for beds ! It is probable, that an hundredth part of the inhabitants of every town are in some one of these situations. How happy are we in comparison !

How many of our fellow-creatures who are up for us all night! the foldier on duty, the failor at sea, &c. But there are ftill more, though they have beds, cannot fleep. Within a very fmall circle, there are but too many fick, who are prevented from fleep by pain; others kept awake by affliction; finners by remorse of confcience; and unhappy people, whofe fecret troubles, poverty, and anxieties for the morrow, do not permit them to tafte repofe. What is then our duty in refpect to them? If it is not in our power to relieve them otherwife, let us at leaft beftow our pity and our prayers upon them. Let us afterwards reflect on our own bed of ficknefs, and death. We fhall fleep in the grave; let us, in the days of our health and profperity, think of this laft bed, which the earth will give us, and let us think of it with confolation and hope.



NOVEMBER IV.

REFLECTIONS ON THE SUMMER WHICH HAS
JUST PASSED.

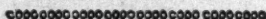
THE fine days are gone; and except the pleasing remembrance of having enjoyed them, there remains nothing now but emblems of frailty. How the whole face of nature is changed! The rays of the fun fall faintly through dark clouds upon gardens ftipped of flowers; on fields where there are fcarce any traces of harveft; and on hills where no verdure is feen. The air no

longer resounds with the melody of birds; the dull silence which reigns is only interrupted by the croaking of ravens, and the screams of the birds of passage taking leave of us to seek more temperate climates. The neighbouring hills are become desert; they are no longer covered with flocks of sheep, nor enlivened by their bleating. Our garden-beds and grass-plots are laid waste. How gloomy and melancholy the appearance of the whole country, once so chearful! Instead of the beautiful verdure, which was its chief ornament, it now offers nothing to the sight but a dead yellowish hue. The clouds are full of chilling rain; and thick clouds veil from us the serenity of morning. Such are the prospects which nature now presents. Who can behold them without reflecting on the instability of all earthly things! The fine days are in a manner flown; and while we were preparing to enjoy them, they disappeared, and are gone. But have we a right to murmur at the dispensations of God? No, certainly, we should rather recollect the summer-days, with the innocent pleasures they afforded, and bless the Ruler of the world for them. What sweet sensations they create! With what pure joy the soul is filled, in contemplating the beauties of nature, when the mountains and vallies grow green before our eyes, and when the lark, soaring in the bright clouds, and the nightingale in the shady grove, both warble their sweet song; when the flowers perfume the air around us; when the morning-dawn sheds universal gladness;

or when the setting sun tinges our woods and hills with the finest glow, what happiness does the enjoyment of nature in full beauty afford us! what rich gifts do the gardens, fields, and orchards, bestow upon us, exclusive of the pleasures they offer to the senses and the imagination! can we reflect on the months that are passed, without a sweet emotion, and without blessing the Parent of nature, who has crowned the year with his mercies? We are now living upon the productions of summer and autumn: We have observed how active nature has been during these fine seasons, in fulfilling the Creator's beneficent views in favour of man. How many plants and flowers have sprang up in spring! How much corn and fruit has the summer ripened, and how plentiful has the autumn harvest been! The earth has now fulfilled its design for this year, and is going to rest for a time. Thus, nature is continually active during many months; and even its present repose is not useless; it is silently preparing a new creation. Let us ask ourselves if we have been equally active; have we so employed our time as to be able to shew the fruits of it? The farmer now counts his sheaves; ought we not to count our virtues and good works? Have the pleasures of the summer made us better or more grateful? Have we raised our hearts towards God in the contemplation of nature? What have our employments been in the long summer-days? Have we done good to our fellow-creatures? In beholding the sun, the flowers, and so

many delightful objects, have we experienced the sentiments which this magnificent scene ought naturally to inspire? Are we conscious that this summer, like many others, has not been thrown away upon us?

Let us be grateful that we still exist upon earth, but let us reflect also that this may be our last summer; and, knowing that we shall be accountable for all those that we pass, let us from henceforth try to redeem the time that we have lost.



NOVEMBER V.

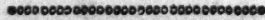
THE INCONVENIENCE OF NIGHT.

AT this season, every night grows longer, and it cannot be denied that this is in some respects disagreeable. For, though part of the night is designed to refresh and strengthen us by sleep, this very refreshment which we require, points to us the weakness and decay of our nature. This is the reason that at night all labour is interrupted, not only by the want of light, but also from the necessity of repose, and from the animal strength and spirits being exhausted. It is therefore natural, that the hours of night should appear long and tedious, when we are restless and cannot sleep. With what impatience does the sick man count the hours, and wish for sun-rise. Another inconvenience of night is, that we are exposed to lose our way, or meet disasters. When the shades of night are spread

Over the heavens, we no longer see where we walk; we are every moment stopped, and making false steps. How many travellers lose their way, and get into bad roads, amongst briars and brambles, into marshes and bogs, and fall down precipices and are killed? We are also exposed to be attacked in the night, either at home, or abroad, by wicked people; for darkness is favourable to all sorts of crimes. Another inconvenience is, that the nights are cold; for, when the sun is set, and its rays are gone down, half the globe is deprived of their enlivening warmth, as well as their light; and this renders the long winter nights very disagreeable. Let us also add that night continually reminds us of death. There is neither constant day nor night upon earth; and, though the time of darkness in winter is long, and that, even in summer, the days are regularly divided by darkness, it is however certain, that God has bestowed more light than darkness upon the earth, by means of twilight, and by the light of the sun and moon.

Let us bless God for the light of the moon and stars, for the rays of the sun, and the splendour of noon-day. But, above all, blessed be his name for the light which his gospel has spread in the midst of error, ignorance, and misery. Let us remember, in our darkest nights, in our hours of sorrow and adversity, that we are advancing towards the regions of light and joy. If sleep sometimes forsakes us in the midst of darkness; if sickness or care forces us to reckon the

melancholy hours; let us comfort ourselves with the reflection, that we are not hopelessly buried in eternal night, but that we are drawing nigh to that blessed habitation, where there will be no change from light to darkness, neither sickness, sorrow, nor care.



NOVEMBER VI.

REFLECTIONS ON WOODS AND FORESTS.

THE woods form the finest picture which the surface of the earth presents to us. It is true, that at first sight, it is a wild sort of beauty. One only sees a heap of trees, and a dull solitude. But to a well-informed mind, who thinks every thing beautiful that is good and useful, there will appear a thousand objects in them worthy attention. They are the more interesting at this season, as the fields and country are no longer so pleasant as in summer. Nothing invites us more to reflect on the grandeur and beauty of nature than a solitary wood. The pleasing shade and still silence we enjoy, lead us to collect our thoughts, and awakens the imagination. The number and variety of the trees are the first objects which attract our eyes. They are less distinguished by their difference of height than by their different stems, forms, and leaves; the resinous pine does not excel in the beauty of its leaves; they are narrow and pointed, but they

last a long time, like the fir, and they preserve their verdure in winter. The foliage of the linden tree, the ash, and the beech, is much more beautiful and varied: their green is admirable; it relieves and charms the sight. The broad indented leaves of some of these trees form a fine contrast with the narrow fibrous leaves of others. We have but an imperfect knowledge of their manner of multiplying, and the use of their fruit. How numberless the ways in which wood is useful? The slow growing oak, the leaves of which are later than any other tree, affords the hardest and strongest wood; which art has taught the carpenter, joiner, and carver, to work into a variety of useful forms, so durable as to seem to defy time. Lighter wood serves for other purposes; and, as it is in more plenty, and grows quicker, it is also of more general use. It is to the forest-trees we owe our houses, ships, and fuel, with many conveniencies for furniture. It is our chief and most natural fuel, to dress our food and keep us warm, as well as for other necessities of life. The industry of man has taught him to polish, shape, turn, carve, and form wood into a multitude of things equally elegant and solid. Divine wisdom has dispersed woods and forests in more or less abundance all over the earth. In some countries they are at great distances; in others they take up several leagues, and raise their majestic heads to the clouds. The scarcity of wood in certain countries is compensated by its abundance in others. Neither the

constant use made of it so lavishly by mankind, nor the ravages of accidental fires, nor severe winters, have yet exhausted these rich gifts of nature; for even a few scattered trees, and humble copse, produce a forest in the short space of twenty years.—Is not the power and goodness of God visible in all this? How superior is his wisdom! If we had assisted at the creation, possibly we should have made many objections to woods and forests; we might have preferred orchards and fertile fields. But the infinitely wise Being foresaw the several wants of his creatures in their different situations. It is precisely in countries where the cold is most severe, and where there is most occasion for shipping, that there is most wood. From the unequal distribution there results a considerable branch of commerce and intercourse amongst men. God intended these advantages to man when he created forests. He vouchsafed to think of us before we could feel our wants, or were able to express them. He anticipated all of them. It is not left to the care of man to plant or keep up forests. Most other things are obtained only by labour. The ground must be ploughed and seeds must be sown. It costs the farmer much trouble and labour. But God has reserved to himself the trees of the forests. It is he who plants and preserves them. They grow and multiply independent of our care. They repair their losses continually by new shoots, and there is always enough to supply our wants. To be convinced

of this, we need only cast our eye on the seed of the linden-tree, the maple, and elm. From these little seeds spring up those vast bodies which raise their heads to the very clouds. It is thou Almighty! that fixest and maintainest them during ages against the force of winds and tempests. It is thou that sendest dew and rain sufficient to make them annually renew their verdure, and in some measure to keep up a kind of immortality amongst them. The earth forms not the forests which it bears, nor does it, properly speaking, nourish them. The verdure, the blossoms, and seeds with which the trees are every year covered, the sap which is continually wasting, are losses which would in time exhaust the earth if it furnished matter for it; as of itself it is a heavy, dry, barren mass, that draws elsewhere the juices and nourishment with which the plants are supplied. The principles, then, of their growth do not proceed from the earth. The air, without our aid, furnishes abundance of salt, oil, fire, and every substance the trees require.

O man! thou art overloaded with blessings. Lift up thine eyes towards the great Being who takes pleasure in doing good unto thee. The forests are heralds of his bounty, and thou must be guilty of the greatest ingratitude, if thou art insensible to this blessing of which every moment may remind thee.

NOVEMBER VII.

THE SENSE OF FEELING.

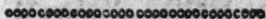
IT may be said with truth, that the touch is the universal sense of animals. It is the foundation of all other sensations; for there can be neither sight, hearing, smell, nor taste, without contact. But as the touch operates differently in the sight from what it does in the hearing; and in the hearing different from the other organs of sensation, we may in this respect distinguish the sense of feeling from that universal sensation above-mentioned. They are both produced by the interposition of nerves. The anatomists reckon ten pair of principal nerves. They are a kind of strings or threads which originate from the brain, and spread through every part of the body to the very extremities. Wherever there are nerves there are sensations; and wherever the seat is of any sense, there also are these nerves which are the general organs of feeling. There are optic nerves, auditory nerves, olfactory nerves, and nerves for the touch, which, with the sense of feeling, are spread throughout the whole body; they proceed out of the spinal marrow, pass through the side orifices of the back bone, and thus disperse through all these parts. These are also in the parts which serve as organs to all the senses; because, independent of their own particular sensation, they must also be susceptible of feeling. This is the reason that the eyes, ears,

nose, and mouth, receive impressions which depend entirely on the touch, and are not produced by their own particular nerves. That the feeling is occasioned by the interposition of nerves is certain, for each member feels more strongly in proportion to the number of its nerves; and the feeling ceases where there are no nerves, or when the nerves have been cut out. Incisions may be made in the fat, one may cut off bones, cut the hair and nails without giving pain. The bone is surrounded with a nervous membrane; and the nails are fastened in a place interwoven with nerves; and it is only when some of these are hurt that pain is felt. Therefore, properly speaking, we should not say we have the toothache, for the tooth, being a bone, can have no sensibility; but the nerve occasions pain when it is irritated.

Let us here admire the wisdom and goodness of God.—In dispersing the sense of feeling throughout the whole body, he evidently ordained it for our good. The other senses are placed in the parts best adapted for the use of them, and for their preservation. Now as it was necessary for the security and welfare of the body that each of its parts should be warned of whatever might be useful or hurtful, agreeable or disagreeable to it, the sense of feeling was spread over the whole body for that purpose. It is another effect of divine Wisdom, that many species of animals have a quicker sense of feeling than ours; for it is necessary to their kind of life, and

compensates them for the want of some other senses. How exquisite must the sense of feeling be in a spider, when in the midst of the web it so curiously spins itself up in, it perceives the smallest motion which the approach of other insects may occasion! But without dwelling on the feeling of animals, it will sufficiently excite our admiration to reflect upon this sense in mankind. How can the nerves, which appear to us to be only susceptible of more or less thickness, more or less tension or vibration, how can they transmit so many different sorts of ideas and sensations to the soul. Can there be such a correspondence between the body and soul, that nerves of a certain construction should produce certain sensations? Has each organ of sense, nerves so ordered and disposed, so analogous to the corpuscles, to the little particles of matter which issue from bodies, that the impressions they receive from thence should always be followed by certain fixed feelings? It seems, at least, as if there was probability in this conjecture, from the pyramidical form of the papillary nerves. But our knowledge is too limited to decide this point; and we must humbly acknowledge, that it is one of those mysteries of nature which it is not permitted us to penetrate. Let us give thanks to God, that amongst the other senses with which we are endowed, he has granted us that of feeling. How many enjoyments should we be deprived of, if we had less sensibility! We could neither distinguish what is beneficial, or avoid what is hurtful to us. Would

that our souls had as lively a sense of what is great and good, as our bodies have of pleasure ! This moral sense was impressed upon our souls. Though it is much weakened, let us pray that it may never be entirely effaced.



NOVEMBER VIII.

A REMEMBRANCE OF THE BLESSINGS THE
SPRING AND SUMMER AFFORD US.

The Original is in Verse.

COME, O my friends, let us acknowledge the goodness of the Creator. Let us gratefully recal the time we have passed in the fulness of joy, when, free from cares or anxiety, the renewal of nature filled us with delight ; when devotion followed us to the bower, and when the very shadow of sorrow was banished our habitations ; when, hand in hand, we sought the flowery paths in pursuit of the Creator, whom we found on every side. From the thick bush, where the foliage drew the songsters of the air, we heard their melodious notes. Friendship, harmony, and innocent mirth, combined to render our pleasures still more sweet. Smiling nature lavishing her flowers upon us, we breathed the balsamic odour upon roses. The pink and gillyflower perfumed the air around us ; and, towards the evening of a fine day, the playful zephyrs wafted sweets to us on their light wings. Then were our souls

filled with mild delight: Our lips opened in thanksgiving to the Lord, and our voices mixed with the songs of the birds. Often, when the breath of the wind had cooled the burning heat of the air, and the birds felt animated with new life; when the clouds were all dispersed, and the great luminary promised to be favourable to us, pleasure gave us wings; we cheerfully forsook the noise of cities, to seek the green shades, nature's bowers. There we were undisturbed. Wisdom, piety, joy, and innocence, attended us to this rural asylum. The trees waving with the evening breeze, while they covered us with their shade, conveyed the most refreshing coolness to us, and Nature drew forth rich sources of content to pour into our pure hearts. There, entirely given up to the Creator, to nature, and to reflections on our happiness, tears of sensibility filled our eyes. The songs of joy, which resounded on every side, accustomed our hearts to grateful gladness. the cheerful bleatings of the well-fed flocks heard from afar; the pleasing sound of the shepherd's pipe; the busy hum of the bees, fluttering round the flowers; even the hoarse croaking of the frogs, warming themselves on the banks of the rivulet; every thing gave us impressions of pleasure; every thing raised us gradually to our Creator. His supreme wisdom was visible to us, in the waters, the air, and beasts, the insects, and the very perfume of the flowers. The most cheerful prospect presented itself to us; such as the happy scenes in which

our first parents lived. At a distance we perceived large and ancient woods, and hills gilded by the rays of the sun; the agreeable mixture of various colours; the rural flowers; the golden harvest; rich grass plots, enamelled by the hand of nature; the treasures of the field; the pasture of the herds and flocks, who yield to us their wholesome milk; and food of man, not yet unfolded from the green corn. Must not all these objects excite every feeling heart to glorify the Creator, and to celebrate his goodness? Here, nature displays to us all the majesty of its Author. This magnificent universe is too beautiful for unthinking Man, for Man to behold unfeelingly. It is for him that the wings of the wind waft their refreshing breezes; it is for him that the silver stream murmurs at the hour of noon, when he rests from his labours; for him that the corn ripens, and the trees bear fruit. The whole creation serves him, and he deigns not to observe it. Those who love God will discover in the zephyr, in the stream, in the meads and flowers, in the blade of grass, and the ear of corn, traces of his eternal wisdom, and, throughout all nature, heralds of his power. The God who created the angel, gave being also to each grain of sand. It is equally through him that the mite and the elephant exist. At the sight of a blade of grass, as at an aloe, the thinking mind is alike raised to its Creator, for the musclee, no less than the whale, proves the greatness of God. Are not his powers as conspicuous in the breeze

of the zephyr as in the storm; in a drop of water as in the ocean; in a spark of fire as in a million of stars.

NOVEMBER IX.

FOREIGN ANIMALS.

EVERY part of the world has animals of its own, and it is for very wise purposes that the Creator has placed some in one country rather than in another. — The most remarkable animals in the southern countries are the elephant and camel. They surpass all the quadrupeds in size. The elephant, in particular, appears like a moving mountain, and its bones are like pillars. Its head is joined to a very short neck, and armed with two tusks strong enough to tear up trees by the root. A longer neck could not support the weight of the head, nor hold it up. But to make amends for the short neck, his trunk is very long. He uses it as a hand to convey food to his mouth, without being obliged to stop for it. He not only moves, bends, and turns it all ways, to do whatever we do with fingers, but he makes use of it as an organ of smell; and this animal may be said to have his nose in his hand. His eyes are small in proportion to the size of his body. but they are bright and full of fire. All his inward feelings are expressed in them. In a state of independence, before the elephant is

tamed, it is neither sanguinary nor fierce. It is of a mild nature, and never makes use of its weapons but in its own defence. It never hurts any body unprovoked, but it becomes terrible when irritated. It seizes its enemy with its trunk; flings it like a stone at him, and then treads him to death. The elephant eats above 100 pounds of grass a-day; but its body being of an enormous weight, it crushes and destroys with its feet ten times more than it consumes in food. Its chief enemy, and often its conqueror, is the rhinoceros, an animal very like the wild boar, that makes use of the horn which grows upon his nose to pierce the belly of the elephant. It requires very little attention to perceive the wisdom of God in the production of the elephant. He has ordained that it should be born in countries abounding with grass, and that it should not become a burden to the earth by multiplying too fast. The female bears her young for two years, and does not begin to increase again till the third year.—The camel is one of the most useful animals in the East. It is admirably adapted to bear the greatest fatigues in the midst of barren deserts and burning sands; being able sometimes to live four or five days without drink, and requiring but very little food in proportion to its size. It browses the few plants and shrubs that grow in the deserts; and when he finds none, two measures of beans and barley serve for a whole day's subsistence. Besides the hump which grows upon his back, there is still another singularity in

its make. This is a double throat, one of which reaches to the stomach, and the other terminates in a bag, which serves him as a reservoir to keep water in. It remains there without corrupting; and when the animal is pressed by thirst, and has occasion to dilute its dry food, it draws up into its paunch part of this water, which moistens the throat, and goes afterwards into the stomach. The common load a camel bears is from 700 to 800 pounds weight; and with this burden they go two German leagues and an half in an hour, and they generally travel 12 or 15 hours a-day. The fleshy foot of the camel is made to walk on sand, while the horny hoof of the horse would be hurt or burnt by it.

The most remarkable quadrupeds in the northern countries are the elk, the sable, and the rein-deer. The first of these animals is large, strong, and finely shaped. Its head something resembles the mule in form, size, and colour. Its legs are long and strong. Its hair of a light grey. This animal is simple, stupid, and timorous. It finds food every where; but it prefers bark, or the tender shoots of the willow, the birch, or the service-tree. It is extremely swift, and having long legs, goes a great way in a very short time.—The sable wanders in the forests of Siberia, and is much sought on account of its beautiful fur. The hunting of this animal is generally the sad occupation of the wretches who are banished to those deserts.—The rein-deer is an animal of a most elegant pleasing form,

very like a stag. It seeks its own food, which consists of moss, grass, leaves, and buds or shoots of trees. The northern nations draw many uses from them. They eat their flesh, drink their milk, and are drawn by them in sledges with extreme swiftness upon the ice and snow. All the wealth of the Laplanders consists in their rein-deer. The skin furnishes them with clothes, beds, and tents, in a word, with all the necessaries of life.

What has been said of these foreign beasts may give rise to important reflections. How prodigious the distance between the elephant and the mite! And what wonderful variety is there in the exterior form of animals, their shape, their organs, their senses, motion, manner of multiplying, &c. ! and yet every thing in them is perfectly adapted and proportioned to the kind of life ordained them. In many parts of the world there are animals which could not bear the climate, air, food, or degree of heat they would find in Europe; neither can it be doubted, but there are millions of animals which could not exist on our globe, and could no more live amongst us, than we could live in the planet of Saturn, or that of Mercury.

NOVEMBER X.

VARIETY OF WINDS.

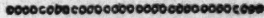
THERE are great variety of winds. In some places they are fixed the whole year, and blow always from the same point. In others, they change at certain periods of time, but still by fixed and regular laws. At sea, between the tropics, and some degrees below them, there is a wind which lasts the whole year without any considerable variation. On the north of the line, the wind blows towards the north-east; and, on the south of the line, it blows towards the south-east, more or less, according to the position of the sun. This must be understood to mean the wind at open sea; for, if islands or great continents are opposed to it, the direction may be changed to north-east. In the southern parts of the ocean the wind is generally westerly. The nearer to the coast the more changeable is the wind, and still more so on land. The constant east wind is chiefly owing to the heat which the sun communicates to our atmosphere. In the Indian seas, there are winds called the trade-winds, or monsoons, which blow for three, or six months of the year from one point, and for the same space of time from the contrary point. These winds have not yet been well accounted for: but certainly we must look for the causes of them in the changes from heat to cold, the po-

sition of the sun, the nature of the soil, meteors taking fire, vapours dissolving into rain, and other such circumstances. There are seas and countries which have winds and calms peculiar to them. In Egypt, and in the Persian Gulph, there is, during the summer, a burning wind, which suffocates and consumes every thing. At the Cape of Good Hope, there forms a cloud sometimes, which is called the fatal wind, or the ox-eye. It is at first very small, but visibly increases, and soon produces a furious tempest, which swallows up ships, and plunges them into the deep. Variable winds, which have no fixed direction or duration, blow over the greatest part of the globe. It is true, that some certain winds may blow more frequently in one place than in another; but it is not at any regular time that they either begin or end. They vary in proportion to the several causes which interrupt the equilibrium of the air: Heat, cold, rain, fair weather, mountains, and even the straits, capes, and promontaries, may contribute very much to interrupt their course, or change, their direction. There are many other causes, certainly, though not yet known to us, for the different modifications and turns to the wind. One thing particularly remarkable is what happens every day, and almost in every place, a little before sun-rise. When the air is perfectly calm and serene, at the dawn of day, there comes a fresh easterly breeze, at the approach of the sun, which continues some time after it rises.

The cause of this must be, that the air being heated by the rising sun, rarefies, and, by its dilating, sends the contiguous air towards the west; this necessarily produces an east wind, which we cease afterwards to feel as the air grows warmer. From the same cause the easterly wind must not only precede the sun always in the torrid zone, but be much stronger also than in our countries, because the sun acts more moderately upon us than it does near the line. In the torrid zone, the wind blows constantly from east to west. A westerly wind is very rarely felt there.

We may observe, then, that the winds are not the effects of chance, to which no cause can be assigned. In this, as in every thing else, the Creator shews his wisdom and goodness. He has so ordained, that the winds should rise from time to time, and that there should be but very seldom an absolute calm. He regulates the motion, force, and duration of the winds, and prescribes the direction in which they are to blow. Even their being variable is a benefit to us. When a long drought causes animals and plants to grow faint and languid, a sea wind sends clouds loaded with vapours, to moisten the ground, and revive all nature. When this is done, there comes a dry easterly wind, to restore the serenity of the air, and give to us fine weather. The north-wind clears away a great quantity of particles, and carries off the noxious vapours of autumn. To the sharp north wind succeeds the southerly wind, which fills the air with an enli-

vening warmth: And to these continual changes of the wind, we owe our health, and the fertility of the earth. Who can make these reflections without adoring God! All the elements are at his command. At his word storms and tempests roar; they rush from sea to sea, from land to land; and, at his command, all is calm again. Whilst, at his command, all the changes of the wind combine for the good of his creatures, may we not believe that the vicissitudes of life contribute to the real happiness of each individual.



NOVEMBER XI.

HUNTING.

HUNTING is one of the chief amusements of a certain order of people at this season, but it is to be wished they did not set such a value upon it; for the power man has over animals, and the pleasure he takes in subduing them, is too often mingled with cruelty. Sometimes, it is true, there is a necessity that animals should be put to death, in order to make the use of them for which they were designed; or to prevent an increase that would be hurtful to us: but even then their death ought to be made as easy as possible; and unfortunately this law prescribed by nature is little attended to by sportsmen. Men, in this respect, shew themselves more cruel tyrants than the

fiercest beast. Is not the way of hunting a hare or stag dreadful to every feeling heart? Can it be an innocent pleasure to pursue with rage and fury, a poor animal which flies from us in violent anguish, till at last, exhausted with terror and fatigue, it falls and expires in horrid convulsions? Is it in humanity not to be affected with such a sight, nor to feel compassion at it? To purchase a pleasure at the death of an innocent creature, is purchasing it too dearly. It is a dangerous pleasure if it makes barbarity familiar to us. It is impossible that the heart of a man, passionately fond of hunting, should not insensibly lose the sweet feelings of humanity. Such a man soon becomes cruel and barbarous; he finds pleasure in none but scenes of horror and destruction; and having accustomed himself to be insensible towards animals, he soon becomes so towards his fellow-creatures. Hunting does not appear to me in general an occupation which we can reconcile with the duties we are called upon to fulfill. Without mentioning the loss of time, (a loss in itself of consequence) it is certain that hunting dissipates too much, and fills the mind with ideas incompatible with serious employments. Gentler amusements are more proper to unbend and divert the mind, than those tumultuous pleasures which do not leave us the use of reflection. Hunting must ever appear a dangerous employment to a moral and religious man; for ought we not to be afraid of a pleasure which leads to sins and irregularities? How

the rational than to the animal soul. If we reflect upon our dreams, and examine why they are generally so irregular and unconnected, and why the events they represent are so odd, we shall find that it chiefly proceeds from our being more affected by sensations, than by perceptions. They represent to us persons we have never seen, or who have long been dead. They appear alive; and we associate them with things actually existing. If the soul acted in our dreams, as it does when we are awake, one moment would set these confused and unconnected ideas right. But in general, the soul does no more than receive and follow the images which are presented to it. And though the objects appear very strongly, they are almost constantly oddly associated and have no coherency. The sensations succeed one another without the soul's combining or putting them in order. It is then sensations only, and not notions, which we have; for the latter can only be when the soul compares the sensations, and operates upon the ideas which the senses convey to it. Thus, the dreams are formed only in the lower region of the soul, or in its inferior faculties. They are not produced by its motive force, and only belong to the animal memory. It is singular, that we never fancy in our dreams that we hear any thing; we only think we see. It is still more extraordinary, that the images we see are perfectly like; and that every object is naturally represented. It seems as if none but the soul of a painter could draw such true and regular pictures; and yet they are performed in

dreams by those who know nothing of that art. Fine landscapes, which we have never seen with any attention, present themselves to us in dreams, as true and exact as if done by the best artist. As to the accidental causes of dreams, by which former sensations are renewed without the assistance of any actual and present impression, we must observe, that in a sound sleep we never dream, because all the sensations are extinguished; all their organs are inaccessible; every thing sleeps, the internal as well as external senses. But the internal sense, which first goes to sleep, is also the first to waken, because it is more lively and active, and is perhaps more easily moved than the exterior senses. Sleep is then more imperfect and less sound; and consequently it is the time for dreams. Former sensations, particularly those on which we have not reflected, are renewed. The internal senses, which, by the inactivity of the exterior senses, cannot be taken up with present impressions, are employed with, and operate upon the preceeding sensations. It acts most upon those which have most strongly affected us; and this is the reason that dreams are generally either frightful or singularly pleasing. There is another circumstance worth observation in regard to dreams: It is, that they mark the character of a man. From the phantoms which fill his imagination in the night, we may judge whether he is virtuous or not. A cruel man continues to be so in his sleep, and the philanthropist preserves his mild and benevolent dis-

position also. It is true, however, that an impure and wicked dream may be occasioned by the state of the body, or by exterior and accidental circumstance. But our conduct when we waken, shews whether these sort of dreams ought to be imputed to us. We need only attend to the judgement we then form of them. A good man is not indifferent about his dreams. If he has deviated from the rules of justice and virtue in his sleep, he is sorry for it when he awakes. It is certain that a mind which falls asleep with a sense of Religion, seldom fails of what may be called heavenly ideas in his dreams. But sleep is not the only time in which our minds are disturbed with odd and fantastic images. How many persons are there who dream awake ! Some from high ideas of themselves, because they have been raised by fortune or the favour of princes. Others make their happiness consist in the pride of fame, and feed on the chimerical hopes of its immortality. Intoxicated with passions and with vain hopes, they dream that they are happy ; but this false and frail felicity vanishes like a morning dream. Persons of this character have well been described by the prophet : “ They resemble a hungry man, who dreameth, and behold he eateth, but he awaketh and his soul is empty ; or as a thirsty man dreameth, and behold he drinketh, but he awaketh, and behold he is faint, and his soul hath appetite.”

Let us never seek happiness in vain phantoms and idle dreams. Let us aspire to none but solid and lasting blessings.

NOVEMBER XIII.

EVERY THING THROUGHOUT THE WHOLE
UNIVERSE IS CONNECTED TOGETHER,
AND COMBINES FOR THE PRESERVATION
OF THE CREATURES IN IT.

EVERY thing which the beneficent Creator has produced upon our globe is admirably connected with one another, so as to contribute to their mutual preservation. The earth itself, with its rocks, minerals, and fossils, owe their origin and continuance to the elements. The trees, plants, herbs, grass, moss, (in a word) all the vegetables, draw their subsistence from the earth, whilst the animals, in their turn, feed upon the vegetables. The earth gives nourishment to the plant, the plant is food for the insect, the insect for the bird, the bird for wild beasts; and, in their turn, the wild beasts become the prey of the vulture, the vulture of the insect, the insect of the plant, and the plant of the earth. Even man, who turns all these things to his own use, becomes himself their prey. Such is the circle in which all things here take their course. Thus, all Beings were created for one another. Nothing was created merely for itself. Tygers, lynxes, bears, ermines, foxes, and other animals provide us with furs to cover us. Dogs pursue the stag and the hare, to furnish our tables: Their share of the prey is very small. The terrier drives the rabbit from its deepest recesses

into our snares. The horse, the elephant, and the camel, are trained to carry burdens, and the ox to draw the plough. The cow gives us milk; the sheep its wool. The rein-deer makes the sledges fly over snow and ice. The swine and porcupine rake into the earth, and the moles stir it up, that the seed of plants and herbs being dispersed, may the more easily propagate. The hawk serves us in fowling, and the hen gives us eggs. The cock wakens us early in the morn; and the lark amuses us with its song in the day time. The whistling note of the blackbird is heard from morn to evening; and the melodious warbling of the nightingale charms us in the night. The stately plumage of the peacock gives pleasure to the sight. The very fish come from the depths of the ocean, venture upon the coasts, and go up rivers, in order to furnish plenty of provision for men, birds, and wild beasts. The silk-worm spins its precious web to clothe us. The bees collect with care the honey we find so delicious. The sea continually throws upon its shores multitudes of crawfish, lobsters, oysters, and all sort of shell-fish for our use. The Jack-a-lantern, or great fly of Surinam, shines in the midst of darkness, to give light to the inhabitants of those countries. If we observe the different occupations of mankind, we shall find that they also tend to the same end which nature purposed. The sailor braves the dangers of seas and storms, to convey merchandizes (which do not belong to him) to their destined place. The soldier

sacrifices his life to his country, and the good of his fellow-citizens. The lawyer is only employed for others. Sovereigns and magistrates who are at the head of government, devote their time and powers to the public. Parents hoard up wealth for their children. The ploughman sows and reaps grain, which he consumes but little of himself. Thus, we do not live for ourselves only; for the wise Author of nature has so ordained, that all Beings should become useful to one another. Let us learn from thence our mutual duties. The strong should assist the weak; the informed man should assist, with his advice, those who want it; the learned should instruct the ignorant; in a word, we should love our neighbour as ourselves, and thus fulfil the designs of the Creator. The mutual offices men owe to one another have made them form into societies. What divided force could not accomplish, is easily performed by united strength. Nobody could erect a fine building, or palace, without assistance. One person alone could not lay the foundation, dig the cellars, make and burn the bricks, raise the walls, put on the roof, make the windows, decorate the apartments, &c. But all this is done with ease when the different workmen assist one another. Such is the constant law of nature, that, in all the arts and sciences, nothing fine or excellent can be accomplished without the concurrence of several persons. How many millions of men does it not require to make a monarchy powerful, an empire happy, a nation

famous or flourishing! In all this, how great does the wisdom of the Creator appear! In order that the inhabitants of our globe, and particularly that mankind might be happy, he formed such relations and connections between all Beings, that they could not subsist without each other. Experience daily teaches us that he had our good in view. The whole world was planned for this purpose, and every part of it concurs towards the felicity of mankind. Even the things which appear to us of so little importance, that we scarce deign to look at them, they all contribute to make us happy. The very insects, we so much despise, are useful to us. Millions of hands labour daily for us. How many animals loose their lives to support ours! and in how many other ways, of which we are ignorant, may not Nature be active in our favour. Let it teach us to value, as we ought, the goodness of God, and to be sensible of our own happiness.

NOVEMBER XIV.

COMMON SALT.

THE seasoning most in use, and that which the rich or poor, the king or the beggar, can least dispense with, is the common salt. Its flavour is so pleasing, and it has such excellent properties for digestion, that it may be considered as one of the most valuable gifts which nature has bestowed upon us. It is given to us in diffe-

rent ways. Those who live near the sea receive it from thence : They dig marshes on the sea shore, which are called saltmarshes, and plaister them with clay ; the sea flows into them when it is rough, and the waves high. The water that remains in the marshes soon evaporates with the heat of the sun, and the salt is left at bottom in great abundance. Nature also produces salt springs, fountains, and lakes. In order to extract the salt out of them the water is boiled in great cauldrons. In other places the salt is found in solid masses in the mountains. The most famous mines are those of Catalonia and Poland. These different kinds of salt are all alike as to their chief properties. Experience has taught us, that salt dissolves in the stomach and bowels, that it has a power of digesting, prevents putrefaction, and too great a fermentation of our food. For this reason it is taken inwardly to promote digestion, to rectify crudities in the stomach, loss of appetite and costiveness. It not only dissolves the pleghm which takes away the appetite and prevents digestion, but it is also a good stimulus for the stomach, the nerves of which it gently irritates, and promotes all its operations. Common salt, therefore, proves to be, perhaps, the best digestive in nature. The other salts are too strong, and too disagreeable to the taste, for the purpose of mixing with our food. — But the common salt acts gently, assists digestion, and prevents the putrefaction to which almost all eatables are liable.—Salt is therefore

a particular blessing which we do not set a proper value on, though we daily enjoy it. If we attended more to our daily blessings, how much gratitude towards God would it excite in us. Most of our food would be insipid and tasteless without salt; yet this is the least of its advantages, as we have observed its great use in respect to health. Another circumstance in regard to salt will appear interesting to every observer of the works of nature: The smallest grain of common salt seems cut into eight angles, or with six sides, like a die; from whence most masses of this sort of salt must be of a square or cubical form. In this again the divine Hand is visible, which has given to salt an invariable form, that has been such from the beginning of the world. This is a very striking proof that it does not owe its origin to a blind chance, but to the will of an intelligent Being. This thought is too important, and too necessary to our peace not to make use of every occasion to recollect, and impress it more and more upon our minds!

NOVEMBER XV.

ORIGIN OF FOUNTAINS AND SPRINGS.

ALL the great rivers are formed by the union of lesser rivers, and these owe their rise to the rivulets which run into them, and the rivulets to the springs and fountains, There can be no

doubt of this. But from whence do the springs come? Water, from its weight and fluidity always fills the lowest parts of the surface of the earth; from whence then can the water come which flows so constantly from the highest regions? — In the first place it is certain, that the rain, the snow, and in general, all the vapours which fall from the air furnish a great part of the water which flows from springs. Consequently, rivers and springs are very rare in the deserts of Arabia, or in parts of Africa where it never rains. These waters penetrate down into the earth, till they find beds of white clay which stop them, as they cannot get through them. There they accumulate and become fountains, or they collect in cavities, which afterwards overflow, and the water gradually gets out through a thousand crevices great and small, still falling towards the bottom, to which its weight naturally inclines it. Thus the water continually flows, and makes itself subterraneous currents, with which other currents mix, and by their union form what is called a vein of water. It is, however, very probable, that, in some countries at least, the springs do not owe their origin entirely to the waters which fall from the atmosphere; for there are on several high mountains considerable springs and lakes, which do not seem as if they could be produced entirely by snow or rain. — There are many springs which give an equal quantity of water at all seasons, and even more sometimes in the hottest and dri-

est weather than when damp and rainy. There must, of course, be other causes both for the rise and supply of springs. Many of them are produced by vapours which are carried up into the atmosphere, and driven by the wind towards the mountains, or by the power of universal attraction, are drawn towards those great masses. The atmosphere is more or less full of watery vapours, which being driven and pressed against hard and cold rocks, condense immediately into drops, and thus swell the springs. However, we must still allow that all the springs cannot be owing to this cause. For must not the Danube, the Rhine, and other great rivers which come from high mountains, dry up when these enormous masses in winter are covered with snow and ice? Certainly there must be caverns, which, by a communication with the sea or lakes, contribute to form springs. The sea-water having gone through subterraneous channels into these great cavities, it rises in vapour through a number of crevices, and forms into drops, which falling again with their own weight, take sometimes quite another course, because water cannot always penetrate where the vapours do. Perhaps also, the sea-water, particularly in countries near the main ocean, may filter through the ground, and produce springs. These springs generally taste like the water from whence they flow. But those upon high mountains cannot proceed from the same cause, because the sea-water cannot rise so high; and, if it could, it

would not be sweet or fit to drink. All the causes are pointed out to contribute more or less to the forming of springs; and there may be other causes unknown to us. It is true, that nature is always simple in its operations; but this simplicity does not consist in making use of one cause only, for each particular effect. It consists in making use of as few as possible, which does not prevent there being always several auxiliary causes which concur in working the effect that nature proposes.



NOVEMBER XVI.

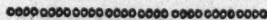
THE HAIR OF THE HEAD.

IF we consider the wonderful construction of the hair of our heads, we shall find it worthy attention, and discover in it evident traces of the Divine power and Wisdom. In each entire hair we distinguish an oblong fine thread, and a knot which is generally thicker, but always more transparent than the rest. The thread is the body of the hair, and the knot is the root. The long and principal hairs of the head have their root, and even a part of the thread, inclosed in a little case, formed by a small membrane. The size of this is in proportion to the size of the root, always large enough to leave a little space between the root and the case. The root has two parts, the exterior and interior; the exte-

rior is a pellicle composed of little flakes; the interior is a glutinous fluid, where some slender fibres meet: this is the marrow of the root. From the exterior part of the root there grow five, and sometimes, though very seldom, six little white threads, extremely fine, transparent, hard, and often twice as long as the root. Besides these threads, there grow here and there other little knots, but they are viscous, and easily dissolved by heat. From the inside of the root grows the body of the hair. It is composed of three parts; the exterior case, the inward tube, and the marrow. When the hair is come to the pore of the skin, through which it is to pass, it is very much wrapped up in the pellicle of the root, which then forms a very small tube. The hair pushes out the epidermis before it, which serves as a sheath to guard it at first, while it is still soft and tender. The rest of the envelope, or coat of the whole hair, is of a particular substance; it is transparent, and more so towards the point. In a young hair the coat is soft; but it becomes afterwards so hard, and so elastic that it shrinks back with some noise when it is cutting. The exterior coat preserves the hair a long time. Immediately under it there are several small fibres, which extend the whole length of the hair from the root to the point. They are joined together, and to the point, by several elastic threads. And this collection of fibres form a tube filled with two substances, one fluid and the other solid; which both together form

the marrow of the hair. An attentive observer of God's works, will acknowledge the Divine Wisdom in the admirable construction of the hair, as well as in all other parts of the human body. There is nothing in the formation of man, from the crown of the head to the sole of the foot, that does not shew the perfection of the Creator. Even those parts which seem of least importance, and which seem the most easy to be dispensed with, become of consequence when considered as connected with the other members of the body, or when their admirable construction and design is inquired into. This we may particularly observe in respect to our hair. How many people are there, who consider it as an object not worth attention, and do not discover in it any traces of the wisdom and goodness of God! But besides that, in general, there is no part of our bodies useless or without design, it is very easy to know the wise purposes for which hair was given us. In the first place, it is visible that they contribute much to the beauty and ornament of the face; but that is perhaps their smallest use. Do they not evidently preserve the head from cold and damp, so as to keep the brain in its natural state of warmth? They certainly also promote a gentle insensible evacuation of bodily humours by perspiration; and they relieve the head and other noble parts from the superfluous moisture which might collect there. They may have many other uses, which are hitherto unknown to us? but these will afford us suffi-

ent subjects to acknowledge and adore the power, the wisdom, and goodness of our great Creator.



NOVEMBER XVII.

SYSTEM OF THE UNIVERSE.

HITHERTO we have only been considering this Earth, which is but a speck in comparison of the immense universe. Let us now raise our thoughts to those innumerable worlds, at the sight of which, this spot that we and millions of other creatures inhabit, will appear as nothing. Let us examine, reflect, and adore. The sun, which gives life to every thing, is almost in the centre of the system; and, without changing place, it turns round its own axis, from east to west, in 27 days and 12 hours. All the planets, from Mercury to Saturn, move round the sun in an oblong orbit or ellipsis. Mercury, which of all the globes is nearest to the sun, performs its revolution in near 88 days, but at so small a distance from the sun, that it is generally concealed in its rays, so as to be invisible to us. Venus describes a larger ellipsis, and finishes her course in little more than 224 days. The earth requires a year to perform its revolution; and, in this annual journey it is attended by the moon. Mars finishes its course in 587 days; Jupiter, with his four moons, in 12 years, or thereabouts; Saturn

moves with his five satellites round the solar circle in the space of thirty years. And lastly, the Georgium Sidus, with his two satellites (already discovered, and it is probable he has many more), which of all the planets known to us is farthest from the sun, in about eighty-two years. But are those the bounds of the universe? No, certainly, far beyond the Georgium Sidus is the region of fixed stars, of which the nearest to us is 27400 times farther from the earth than the sun is; though this is, when at its greatest distance, 23000 semi-diameters of the earth. How many globes also may there be in the great space between Saturn and the fixed stars, that are not visible to us! But, is it possible that the sun, which we daily behold traversing the sky in 12 hours, should remain fixed in the centre of the world? Do we not, in the morning, see it in the east, and, in the evening, in the west? Could the earth move round the sun, without our perceiving it? This objection, founded on the illusion of our senses, is of no weight. Do we perceive the motion of a boat, in sailing upon the river; and, when we are in a boat or carriage, does it not seem as if every thing round us moved, and as if all the objects went back out of their place, though in reality they never move? However our senses may be deceived in this respect, our reason forces us to acknowledge the truth and wisdom of the system which supports the motion of the earth. Nature always acts in the shortest, easiest, and simplest ways. By the single revo-

lution of the earth round the sun, we can account for the different appearances of the planets, their periodical motions, their situations, their direct and their retrograde motions. And is it not much more natural and easy, that the earth should turn round its axis in 24 hours, than that such great bodies as the sun and planets should move round the earth in that space of time. One undeniable proof of the sun and not the earth's being in the centre of the world, is, that the motions and distances of the planets depend upon the sun, and not upon the earth. If it was otherwise, where would be the harmony and perfect conformity, which is now so evident in all the works of the Creator? According to our hypothesis, each planet has the same motion we attribute to our earth.

These reflections on the system of the universe, are calculated to give us the highest idea of our adorable Creator, and to make us sensible of our own insignificance. With what pleasure our mind passes from one idea to another, till it is lost in the contemplation of those great objects! With what profound veneration and admiration does it feel the greatness of its God. It is true, that the limits of the human understanding will not permit us to have an exact and perfect knowledge of the system of this world, but we know enough to be convinced, that the whole is planned with infinite wisdom and goodness, and that no system could be formed more beautiful, more

worthy of the Supreme Being, or more beneficial to the inhabitants of the different globes.

NOVEMBER XVIII.

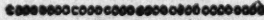
LOBSTERS.

IF lobsters were of no value to us as food, they would still be worth our attention. The females of the crustaceous fish undergo a great change some weeks before this time of the year. They throw off their old shells and get new ones. This is called their moulting. It is in this manner that all crustaceous animals grow: The body of the lobster continuing to increase, while its shell remains unalterably the same, the animal becomes too large for its habitation, and is obliged to force its way out, which is a very painful operation. At the same time that they change their shell, they change their stomach and intestines. The animal, while it is moulting, seems to feed upon its former stomach, which wastes by degrees, and is replaced with a new one. The little round white stones, improperly called *crab's eyes*, begin to form when the stomach is consuming, and are afterwards inclosed in the new one; where they continually diminish in size, till at last they entirely disappear. It is probable, that the animal makes use of them as a remedy for the disorders of its stomach; or, perhaps, this matter has a petrifying quality proper for form-

ing a new shell. Except at the time of moulting, the lobsters keep at the bottom of the water near the shore. In winter they prefer the deep parts of the water; but in summer they draw near the shore, if the want of food does not oblige them to go deeper down into the water. That they might catch their prey more easily, nature has given them several claws and legs. Sometimes they have claws as large as both head and body; and what is still more singular, they have the faculty of producing new claws and horns when they have lost any. They can even get rid of them when they become inconvenient. The lobsters perform this operation in any posture, but they do it more easily if they are thrown on their backs, and if with strong iron pincers the shell is broken, and the flesh bruised at the third or fourth joint of the claw. Soon as the wound is made, the lobster in its pain shakes its claw about till it falls from the body. As soon as the claw is broken, there comes a glutinous substance over the wound, which stops the bleeding. If this was moved, the animal would lose all its blood and perish. This substance envelopes what we may call the shoot of the new limb, which at first appears only an excrescence, or a little cone. By degrees this cone lengthens into the form of a claw, and becomes as perfect as the old one. These animals grow pregnant about autumn, as may be seen (if they are opened at that season) in the form of red clots, which gradually disappear. After-

wards, underneath the tail is filled with little round eggs like hemp seed, fastened by small fibres together. The first eggs appear in December, and soon increase to hundreds. They enlarge by degrees as the weather grows warm; and before mid-summer there are very small live lobsters found amongst the eggs, the size of an ant, which stick to the fibres under the tail; where they remain brooding till all the eggs are hatched. They afterwards loosen from their mother, and cling to the fibres of some roots of trees which they find in the water near the shore; where they remain protected till they are large and strong enough to venture into the sea. The lobster is certainly one of the most extraordinary creatures that exists. An animal whose skin is a shell, and which it casts off every year, to clothe itself with new armour. An animal whose flesh is in its tail and legs; and whose hair is in the inside of its breast; whose stomach is in its head; and which is changed every year for a new one; and which new one begins by consuming the old one. An animal which carries its eggs within its body, till they become fruitful; and then carries them outwardly under its tail. An animal which can throw off its legs when they become troublesome; and can replace them with others; and lastly, an animal whose eyes are placed in long moving horns. So singular a creature will long remain a mystery to the human mind. It affords new subject, however, to

acknowledge and adore the power and wisdom of the Creator.



NOVEMBER XIX.

THE PROPER AND CONVENIENT SITUATION OF ALL PARTS OF THE HUMAN BODY.

IF we examine the human body with any attention, we cannot but observe, that all the parts of which it is composed, are placed in the manner best adapted for their several uses. The wisdom of the Creator has allotted to each member its proper place; and, in the formation of our bodies, he has not only attended to our wants and conveniences, but to ornament and beauty. In the first place, with respect to our *wants*, it is evident, that all the parts are placed in the manner most convenient to the body. It was intended to be a machine which was to move of itself by the powers given to it, without requiring to be moved by any exterior force. It was necessary that our limbs should perform with ease and promptness the will of our mind. All the bones are joined together; but, in order that we should make use of our limbs without difficulty, to stretch or draw in an arm, to stoop or rise as we please, the bones are divided into joints, and each bone is rounded at the end, and set within the spherical cavity of another bone,

where it moves with ease, because it is covered with a smooth polished gristle, and moistened with an oily humour, which prevents the gristle from rubbing. How wonderful is it, that these bones should be so firmly set, as not to slip or separate from each other, tho' the feet bear so great a burden, and the hands are sometimes obliged to lift a weight of an hundred pounds.— In placing the parts of the body God has also attended to our *convenience*. The determination and will of the soul may be executed by the organs of the body without any difficulty or obstacle. By means of the senses it is immediately informed of whatever interests it, and the several members of the body directly obey its orders. The *eye*, as it is designed to watch the whole person, occupies the highest place. It can turn freely on all sides, and observe every thing that passes. The *ears* also are placed in a distinguished part at the two sides of the head, and are open night and day to convey to the soul every impression of sound, and to make it attentive to the least noise. As our food passes through the *mouth* into the stomach, the organ of *smell* is placed immediately above it, to guard it, as the eye also does, from receiving any thing corrupted or bad. As to the sense of *feeling*, it has not its seat in any particular place, but is spread over all the parts of the body, in order to make it distinguish pleasure from pain, and wholesome from hurtful things. The *arms* are the ministers the soul employs to execute most of its desires, and are

therefore placed near the chest, where the body is the strongest; and, without being too far from the lower parts, are most conveniently situated for every sort of exercise and work, as well as for the guard and safety of the head and other members.—Lastly, the Creator, in the formation of the human-body, has designed also to attend to its *beauty*. This consists in the visible harmony, the exact proportion of the limbs, and the pleasing mixture of colours in a fine and delicate skin. We may observe, that those parts of the body which are in pairs, as our eyes, ears, arms, legs, are placed at the two sides, of an equal height, corresponding with each other on the right and left; whereas those that are single, as our forehead, nose, mouth, and chin, are placed in the middle. The proportion appears in the great as well as in the small. The length of the sole of the foot makes the sixth part of the height of the whole body, as the face makes the tenth. In children the head is larger than it ought to be in proportion to the rest; because the head being the chief part of the body, and the seat of our four senses, it ought to come the sooner to perfection; and the more so, as being composed entirely of bone, it could not extend as much as the fleshy members, which it must otherwise have done; for we observe, that in infancy all the limbs grow at the same time, and spread with the most exact proportion in length, breadth and thickness, according to the size of the whole body.—Admire, O man, the per-

fection and beauty of thy body, the admirable connection, harmony, and proportion of all its parts. Observe, that each limb is connected with others ; that they never interfere with each other's different function ; that they are placed in the manner best adapted for their use, and so as to assist one another mutually. The organs are so many springs in this admirable machine. They correspond with each other, and act in concert to fulfil the several purposes for which they were designed. Take care not to destroy this machine, so curiously contrived, nor to deform it by excesses and irregularities. On the contrary, let thy body ever remain a monument of the wisdom and goodness of God. But above all, never neglect thy soul, which has been degraded by sin, but endeavour that it may be restored to its primitive purity by the mediation of thy Redeemer. It is by this alone that thou canst be compensated for the change thy body will undergo, when it shall return to the dust from whence it came.

NOVEMBER XX

THE ORDER AND REGULARITY OF THE
COURSE OF NATURE.

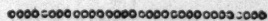
IN contemplating the world we every where discover traces of a supreme Intelligence directing the whole, which foresaw all the effects that

were to result from the powers it impressed upon nature; which had numbered, weighed, and measured all things with infinite wisdom. Thus the universe, when once formed, may always continue and constantly fulfil its design, without the necessity of changing any of the laws originally established. This is not often the case in respect to the works of man. The best contrived machines soon fail to answer the purposes intended. They require to be frequently mended.* They are soon spoiled and out of order. The cause of these faults is in the original construction; for there is no artist, however skilful, who can foresee all the changes to which his work is liable, much less is he able to obviate them. The coporeal world is also a machine, but the parts of which it is composed, and their several uses, are numberless. It is divided into many luminous and opaque globes, which serve as habitations for an infinite multitude of living creatures of all sorts. The opaque globes, move in the circles prescribed to them, and in a regular time round the luminous globes, in order to receive from them the light and heat, day and night, seasons and various climates, food and growth, according to the nature and wants of the different inhabitants. The situation of the planets and their mutual gravitation are so diversified, that it seems almost impossible to determine before-hand the time of their returning to the point from whence they set out, to begin again their periodical course; and yet notwith-

standing the variety of phenomena which these globes present us, and the astonishing number of their movements, in the course of thousands of years these enormous masses have never once hit against one another, or interrupted each other's course. All the planets regularly run their course in the time prescribed them. They have constantly preserved their direction and respective distances from the sun. The fixed stars are the same now that they were two thousand years ago. Their distances, their projective force, their direct ascension, their declination, their parallax, their direction, are ever the same. The sun also is still at the same height, the days and nights, years and seasons, are all what they were formerly. An undeniable proof, that, in the first arrangement of the celestial bodies, and the regulation of their course, the Author of Nature foresaw and determined the future state of the world, and of all its parts, to the end of time. The same may be said of our earth, which is annually subject to many revolutions and changes of climate. For, though it seems at first, as if the fine weather, the cold, heat, dew, rain, snow, hail, lightning, storms, and winds, were dispensed by chance; as if it was from mere accident that the waters overflow the earth, changing lands into lakes, and in other places seas appearing where there were continents, mountains forming while others are mouldering away, rivers are drying up or changing their course; yet it is certain that each mo-

dification of our health has its sufficient cause in the preceding modification; the last in the former, and so the same from the beginning of all things. But nothing is more calculated to make us sensible of our ignorance in respect to the particular causes of natural events, and their connection with the future, than this variety which we observe in the temperature of the air; a variety which has such an effect on the appearance and the fertility of our globe. In vain we repeat our meteorological observations; we cannot deduce from them any certain rules and consequences for the future, and we shall never find one year perfectly like another. Yet we are well convinced, that these continual variations, this apparent disorder in the elements, do not destroy our globe, do not alter its form, or make it an uninhabitable chaos; but are, on the contrary, the true means of preserving from year to year, its order, fertility, and abundance. Since, therefore, each present modification is founded upon the former, it is evident, that the elements were not formed and combined by a blind chance; but that from the beginning, boundless wisdom produced, combined, mixed the elements, measured their force, and determined their effects to all eternity. Thus the world is not composed of unconnected materials, which have no relation to one another. It is one regular and perfect whole, the construction and plan of which is the work of a supreme Intelligence. If we behold in the world a multitude

of Beings of the same nature and design with ourselves, and connected with us in many ways; if we discover a still greater number of species of other creatures who are also more or less mutually connected; if we acknowledge, that by the mixture and action of the elements, all these animated Beings are preserved, and receive all that their nature requires; if afterwards we look beyond this, and raise our thoughts higher; if we consider the connection between our earth and the celestial Bodies, the constant regularity of all their motions, the conformity, the wonderful harmony between all the globes within our sight; we shall be more and more struck with admiration of the magnificence, order, and beauty of Nature, and more clearly convinced of the infinite wisdom of the Creator. But all that we yet know of the order and harmony of the corporeal world, is but a slight ray of that great light of eternity, by which the Divine Wisdom, now in many ways impenetrable to us, will be made manifest to us hereafter.



NOVEMBER XXI.

WINTER IN THE NORTHERN COUNTRIES.

THE time now draws nigh of which so many discontented people complain: Winter, this severe season appears to them inconsistent with the plan of the Ruler of the universe, in other

respects so wise and beneficent. The rich complain that nature is become dull and melancholy, The poor, whose poverty and wants increase at this season, murmur and lament. Yet let them ever so much magnify the inconveniencies and distresses of winter, they will at last be forced to acknowledge the goodness of God towards them, even in this respect, if they compare their lot with that of some other nations. In great part of the northern countries there is neither spring nor autumn. The heat is as intolerable in summer as the cold is in winter. The severity of the latter is such, that the spirits of wine in the thermometers freeze. When the door of a warm room is opened, the outward air which comes in, turns all the vapours into snow; and they appear like thick white clouds. If any one goes out of the house, they are almost suffocated, and the air seems to pierce through them. Every thing appears dead, as nobody dare venture abroad. Sometimes the cold becomes so intense, all of a sudden, that if they are not saved in time, people are in danger of losing an arm, a leg, or even their life. The fall of snow is still more dangerous; the wind drives it with such violence, that nobody can find their way, the trees and bushes are covered with it, the sight is blinded by it, and people sink into precipices at every step. In summer it is constantly light for three months, and in winter it is perpetual night during the same space of time. We who complain of the cold in our countries,

what should we say if we were to live in the climate just described? It is certain we do not know our advantages, or a very little reflection would make us content with our lot. The winter days, however melancholy and severe we may think them in our countries, are not insupportable from the nature of our constitution, and those who cannot bear them, it is their own fault. But wherefore has the Creator ordained that millions of people should live in countries where nature fills them with terror for a great part of the year? Why has he not made all his people as happy as we are? Senseless enquiry! We are mistaken if we suppose that the inhabitants of the pole are unhappy from the severity and length of their winter. Poor, yet exempt through simplicity from all desires difficult to gratify, those people live content in the midst of the rocks of ice which surround them, without knowing the blessings which the southern nations consider as an essential part of their happiness. If the barrenness of their soil prevents them from having such variety of productions of the earth as we have, the sea is so much the more bountiful in her gifts to them. Their way of living inures them to cold, and enables them to defy storms. As to particular resources, without which they could not bear the rigour of the climate, Nature provides them with abundance. Their deserts are full of wild beasts, whose furr protects them from cold. The rein-deer supplies them with food, drink, beds, clothes, and tents. These

are most of their wants, and give them little trouble to obtain. When the sun does not rise with them, and they are surrounded with darkness, Nature itself lights a torch for them. The Aurora Borealis brightens their night. Perhaps, those people consider their country as the greatest and happiest upon earth, and may pity us as much as we pity them. Thus we find that every climate has its advantages and inconveniencies, which are generally so well balanced, that it is difficult to say which merits a preference. To consider things in this light, there is no country on earth, whether the sun darts his rays upon it perpendicularly or obliquely, whether it is covered eternally with snow or not, which in reality is more benefited than another. In one place, the conveniencies of life are more abundant. In another, that variety is absolutely wanting; but those who have not such comforts escape many temptations, corroding cares, bitter remorse; in a word, they are ignorant of many obstacles to happiness, which compensates them for the pleasures they are deprived of. We know with certainty, that Providence has dispensed to every part of the world, whatever was necessary for the support and happiness of the people, who are every where adapted to the nature of the climate.

NOVEMBER XXII.

THE TRANSFORMATIONS IN NATURE.

THE transformations in Nature are very numerous; or rather, it may be said, that every thing in the natural world is transformed. The form of objects continually varies. Certain bodies pass successively through the three kingdoms of nature; and there are compositions which gradually become minerals, plants, insects, reptiles, fish, birds, beasts, and men. Every year, millions of bodies mix together, and are reduced to dust. Where are the flowers which adorned our gardens, fields, and meadows, during the spring and summer. One species appears, then fades, and makes room for another. The flowers of March, with the modest violet, after having proclaimed the coming of spring, disappear, and give place to the tulip and the rose. In the room of these come others, till all the flowers, in their turn, have fulfilled their design. It is the same, in respect to mankind. One generation rises, and the other disappears. Every year, millions of human bodies return to the dust from whence they came; but, out of these reduced bodies, there are new ones formed. The salts and oils, of which they are composed, dissolve in the earth; the more subtile parts are attracted by the heat of the sun, and rise into the atmosphere, where they mix with other substances, are scattered here and there by the wind, and fall again.

in rain and dew, sometimes in one place, and sometimes in another. As for the grosser parts they mix with the earth. The grass which is nourished by them shoots up into long stalks. It is thus that the flesh of man, transformed into grass, serves to feed those flocks, the salutary milk of which turns afterwards into our own substance. These continual transformations in nature are certain proofs, that the Creator ordained that nothing should be useless or lost. The meal on the flowers, which is the source of fertility in plants, is but a very small part of what each flower contains, but this superfluity is not lost. Divine wisdom created bees, who make use of it for their honey. The earth bestows daily gifts upon us, and would at last be exhausted, if what it yields was not to be returned again. All organized bodies dissolve, and turn at last to earth. During this dissolution, their volatile parts rise into the atmosphere, and are dispersed about. Thus, the remains of animals are scattered in the air, the earth, and water; and perhaps the parts which fly into the atmosphere are not the least numerous. All these particles, dispersed here and there, unite soon again in new organized bodies, which will, in their turn, undergo the same chance. These constant transformations, this circulation, which began with the world, will only end with it. But the most remarkable, or at least the most interesting to us, is that which relates to ourselves. We know that our bodies were not

originally, nor will they hereafter be, composed of the same number of particles as at present. Our bodies, when in our mother's womb, were extremely small; they were larger at our birth; and, since then, they have increased to fifteen or twenty times the size; consequently blood, flesh, and other foreign substances, drawn from the animal or vegetable creation, which did not originally belong to our bodies, have since been united with them, and are become parts of ourselves. The necessity we are under of eating every day shews a continual waste of the parts, and that this loss must be repaired by food. A great deal evaporates insensibly; for it appears, from certain experiments, made by a great physician upon himself, that, out of eight pounds of food, which a man in health may take every day, there is but a fiftieth part of it which turns to his own substance. All the rest goes off by perspiration, or other excretions. From this it may be inferred, that, ten years hence, there will not remain many of the particles of which we are now composed. And finally, when our bodies shall have gone through several changes, they will be transformed into dust, till the day of resurrection, when that last and happy revolution will fix them immutably and for ever. Let us rejoice in this future state, where we shall be free from all the changes of this life. Let us behold, with serenity, the daily revolutions to which all earthly things are subject, and which are necessary in our present state. It

is by this means that we shall draw nearer to perfection.



NOVEMBER XXIII.

GREATNESS OF GOD EVEN IN THE SMALLEST THINGS.

WHOEVER loves to contemplate the works of God, will trace him not only in those immense globes which compose the system of the universe, but also in the little worlds of insects, plants, and metals. He will acknowledge and adore divine Wisdom as much in the spider's web, as in the power of gravitation which attracts the earth towards the sun. These researches are now the easier, as the use of microscopes discover to us new scenes, and new worlds, in which we behold in miniature, all that can excite our admiration. Those who have no opportunities to make use of these instruments, may read at least with pleasure some remarks on microscopic objects.—Let us, in the first place, observe the inanimate world. Behold those mosses, and the grass which God has produced in such abundance. Of how many fine threads and little particles are those plants composed! What variety in the forms and shapes! Who could count all their sorts and kinds? Think of the multitude of little parts which any one is composed of, and into which it may be divided. If an

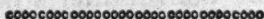
hexagon of the size of an inch contains an hundred millions of visible particles, who could calculate the parts of which a mountain must be composed? If millions of particles of water may be suspended on the point of a needle, how many must there be in a fountain? how many in the rivers and seas! If from a lighted candle there issues in a minute many more particles of light than there are grains of sand over the whole earth, how many fiery particles must fly out of a great fire in the space of an hour! If a grain of sand contains several millions of particles of air, how many must there be in the human body! If odoriferous bodies can exhale enough of odoriferous corpuscles, to send the perfume to great distances, without any sensible loss of their own weight, it would require an eternity for the human mind even to cultivate the prodigious number of these particles. If we pass next to the animated creation, the scene will in a manner extend to infinity. In the summer time the air swarms with live creatures. Each drop of water is a little world inhabited. Each leaf of a tree is a colony of insects; and perhaps each grain of sand contains a multitude of animated Beings. Each plant, grain, and flower, feeds a million of creatures. Every one must have seen the innumerable swarms of flies, gnats, and other insects which collect together in a very small space; what prodigious shoals must there be in proportion over the whole earth, and in the immense expanse of the atmosphere! How many

millions of still smaller insects and worms are there crawling on the ground or underneath it, the number of which is known only to God! Does not the power of the Creator strike us with astonishment, when we reflect on the multitude of parts of which these little creatures are composed, whose existence is scarce known! If we could not at any time prove it by experiments, should we imagine that there are animals a million of times less than a grain of sand, with organs of nutrition, motion, &c. There are shell-fish, so small, that even through a microscope, they scarce appear as large as a grain of barley, and yet they are living animals, with houses, in which there are different apartments. How extremely small is the mite, and yet, this almost imperceptible atom, when seen through a microscope, is a hairy animal, perfect in all its limbs, of a regular form, full of life and sensibility, and provided with all the necessary organs. Although this animal is scarce visible to us, it has many parts still smaller. One circumstance particularly admirable is, that the glasses which discover so many defects in the best finished works of man, shew us nothing in these microscopic objects but regularity and perfection. How inconceivably fine and tenuous are the spider's thread! It has been calculated, that 36,000 of them would only make the thickness of common sewing silk. Each of the six papillæ, from whence the spider draws the visciduous liquor with which it makes the web, is composed of many

lesser insensible papillæ, which serve as so many wire-drawing irons for the threads to pass through, in such numbers, that one of the strongest of them consists of 6000 lesser threads. How must this strike the mind with astonishment. But, suppose we had microscopes which could magnify some millions of times more than those do through which the mite appears as large as a grain of barley, what wonders might we not then discover ! Even then we should not be able to see to the end. It would be presumptuous and extravagant to suppose it. Each creature has a kind of infinity, and the more we contemplate the works of God, the more will the miracles of his power multiply in our sight. Our imagination is lost in the two extremes of nature, the great, and the small; and we know not in which to admire the Divine Power most, whether in those immense globes which roll over our heads, or in those microscopic object, almost imperceptible to the sight. Let the contemplation of God's works be therefore our most pleasing occupation. The trouble we may take in studying them will be well rewarded, by the pure and innocent pleasures they afford. It will awaken in us an ardent desire to arrive at those happy regions, where we shall not want microscopes or telescopes to discover the wonders of God's works, which will be directly visible to us, so as to know the design, construction, and connection of each object; where endless hymns will be chaunted to the praise of the Creator of the

temperature of air during the months immediately following summer, as to prepare us by degrees to bear the increase of cold, without any bad effects from it. What would become of those animals whose constitutions cannot bear cold, if winter was to come suddenly without notice upon them. Two thirds of the birds and insects would be destroyed in a night, and their nests and eggs with them; but now, by the gradual progress of cold, they have time to make the necessary preparations against it. The autumnal months warn them to quit their homes, to go into warmer countries, or to seek places where they may sleep quietly and secure during the severe season. It would be no less fatal to our fields and gardens were the earth to be suddenly deprived of the summer's heat. All plants, (particularly the exotic plants,) would inevitably perish. Spring would produce no flowers, nor would summer afford us fruit.—We should not therefore consider it of little consequence, that from the end of summer to the beginning of winter the heat should gradually give place to cold. These insensible changes were necessary for our preservation, and that of the produce of the earth. Presumptuous man, though so often daring to murmur at the laws of nature, would soon find to his cost, were he able to derange one single wheel in the great machine of the world, that he would do much mischief, but could make nothing better. Nothing in nature operates suddenly. There is no revolution without a proper

preparation. All natural events succeed one another by degrees, all in the most regular manner, and precisely at the appointed time. Order is the great law which God lays down in the government of the world; and from thence it is, that all his works are so beautiful, so invariable, and so perfect. Let it be our constant employment to study this beauty, this perfection, in the works of God, and at every season of the year to trace the divine wisdom and goodness. We should then cease those senseless murmurs with which we offend the Creator so often. We should find order, wisdom, and goodness, in the very things we fancy imperfect, and we should say at last, from the strongest conviction, that "all the paths of the Lord are mercy and truth."



NOVEMBER XXV.

REFLECTIONS ON SNOW.

DURING winter, (the dullest season of the year) the ground is often covered with snow. Every body sees it fall, but very few take the trouble to inquire into its nature and use. Such is the fate of most objects which we have daily before us, though we derive many advantages from them. Those things most worth attending to are often what we least value. Let us learn to be wiser, and let us employ some moments in reflecting upon snow. It is formed of very light vapours, which congeal in the atmosphere, and

fall again in flakes more or less thick. In our climates the snow is pretty large, but travellers assert, that in Lapland it is sometimes so small, that it is like a fine dry dust. This certainly proceeds from the great cold of those countries. We observe, that the flakes are larger with us in proportion as the cold is more moderate, and they become smaller when it freezes hard. The little flakes of snow are generally like hexagon stars, but there are some of right angles, others of ten, and some also of an irregular shape. The best way of examining them is to receive the snow on white paper. But there has not hitherto been any satisfactory cause given for the variety of forms. As for the whiteness of this meteor it is not difficult to explain. Snow is extremely thin and light, consequently it has a great many pores, which are certainly full of air. It is, besides, composed of parts more or less close and compact. Such a substance does not admit the rays of the sun, or absorb them, on the contrary, it reflects them very strongly, which makes it appear white to us. Snow newly fallen is twenty-four times lighter than water. If 24 measures of snow are melted, they produce but one of water. Snow is not frozen water, but only frozen vapours. It evaporates considerably, which the most intense cold cannot prevent. It has been doubted whether it snowed at sea; but those who have gone voyages in the winter on the northern seas assure us, they have had a great deal of snow there. It is known that the high mountains are never en-

tirely free from snow. If part of it melts it is soon replaced by more. The air being much warmer in the plains than on heights, it may rain with us while it snows heavily on high mountains. Snow is of use in several ways. As the winter cold is much more hurtful to vegetables than to animals, the plants would perish if they were not preserved by some covering. God ordained therefore, that the rain, which in summer cools and revives the plants, should in winter fall in the form of a soft wool to cover the vegetables, and to guard them from the inclemency of frost and winds. The snow has a degree of warmth in it, but not too much, so as to choke the grain. As (like all other vapours) it contains different salts, which it leaves in the ground when it melts, this much enriches the earth. The melted snow not only moistens the earth, but washes every thing hurtful away from the winter seeds and plants. What remains of the snow-water helps to fill up the springs and rivers which had diminished during the winter.

These reflections may convince us, that winter has its advantages, and is not so melancholy a season as many imagine. Let us look up with joy and gratitude towards that beneficent God who causes blessings to flow, even from clouds of snow, upon the earth. How unpardonable to murmur, when it is our own faults if we do not every where discover traces of the divine wisdom and goodness.

NOVEMBER XXVI.

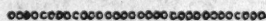
SLEEP OF ANIMALS DURING WINTER.

NOW that Nature is deprived of so many creatures which rendered it beautiful and animated, it appears dead. Most of the animals that have disappeared are buried in a profound sleep for the winter. This is the case, not only with the snails, but the bugs, ants, flies, spiders, caterpillars, frogs, lizards, and serpents. It is a mistake, to suppose that the ants lay up provisions for the winter. The least cold numbs them, and they remain in that state till the return of spring. Of what use then would their stores be, since nature has prevented their requiring food in winter? What they collect in summer, with so much care, is not for their subsistence: They use it as materials to build their habitations. There are also many birds, who, when food begins to fail, hide themselves under ground, or in caves, to sleep all the winter. It is at least asserted that, before winter, the *shore*-swallows hide under ground, the *wall*-swallows in the hollows of trees or old buildings, and the *common* swallows go to the end of ponds, and fasten themselves in pairs to some reeds, where they remain lifeless and motionless, till they are revived by the return of fine wheather. There are also some beasts, which bury themselves in the ground, at the end of summer. The most remarkable of them is the mountain rat, which generally makes it abode in

the Alps. Tho' it loves to be on the highest mountains, in the region of ice and snow, it is sooner numbed with cold than any other animal; for which reason, it retires, about the end of September, or the beginning of October, into its subterraneous lodging to remain there till April. There is much art and precaution in the plan of their winter residence. It is a sort of gallery, the two branches of which have each their particular opening, and both terminate in a place without any, where they live. One of these two wings goes sloping down underneath their dwelling place; and, it is in this lower part of their house that they leave their excrement, which the wet carries away. The other wing is the highest, and is their place of entrance in and out. Their dwelling place is lined with moss and hay. They make no provision for winter, as it would be useless to them. Before they enter their winter quarters, they prepare themselves each its bed of moss and hay, and then, having well closed the entrance into their houses, they compose themselves to sleep. As long as this state of insensibility lasts, they absolutely live without eating. The beginning of winter, they are so fat that some of them weigh twenty pounds, but, by degrees, they fall away, and are very thin in spring. As they do not eat in winter, they have no evacuations. Their great gut is furnished with valves, in the form of a ring, which retain the excrement till their time of waking. It is said that, as soon as these animals begin to feel

the cold, they go to some spring, and drink copiously for a long time, till what they discharge is as clear and as pure as when they drank it. A natural instinct prompts them to it, in order to prevent the corruption which the accumulated matter in their stomachs might occasion, during their long sleep. When these rats are discovered in their retreats, they are found rolled up round, and sunk into the hay. Their nose is laid on their belly, that they may not breathe a damp air. During their torpid state, they are carried away, without being wakened, and they may even be killed without appearing to feel it. There is another sort of rats whose sleep is as long and as sound as these, and are therefore called the *sleepers*. The *bears* eat prodigiously at the beginning of winter, as if they meant to eat enough at once for their whole lives. As they are naturally fat, and are excessively so at the end of autumn, this abundance of fat enables them to bear their abstinence, during their winter's repose. The badgers prepare for their retreat into their burrows in the same manner. The instinct of these, and many other animals, teaches them thus to dispense with food for a considerable time. Their very first winter, (before experience could inform them) they foresee and prepare for their long sleep. In their peaceable retreats, they know not what want, hunger, or cold is; they know no season but summer. It is remarkable that all animals do not sleep thus in winter. It is only those, who, with the severe cold, can

also support an abstinence of several months. If winter was to come upon them unprepared, and, that suddenly weakened and numbed with want of food and the cold air, they should still survive it, the only thing we could wonder at, would be the strength of their constitution. But, as they know how to prepare in time for their sleep with much care and precaution, it must be imputed to a wonderful instinct bestowed upon them by the Creator. The wisdom and goodness of God have supplied all the wants of his creatures, and this by a thousand means which no human imagination could think of.



NOVEMBER XXVII.

USE OF STORMS.

PERHAPS there are many who at this stormy season reckon the winds and tempests amongst the evils of nature. We do not always think of the advantages which accrue from them; and we do not consider that we might be miserable without them, as we certainly should; for it is the storms which purify the atmosphere. To be convinced of this, we need only attend to the general temperature of this season. What thick and unwholesome fogs, what rainy, dark, and cloudy days it brings? The storms are chiefly designed to disperse these hurtful vapours, and remove them from us; and this is certainly do-

ing us a great service. The universe is governed by the same laws as man, who may be called a little world. Our health depends, in a great measure, on the agitation and mixture of our humours, which would otherwise corrupt. It is the same with the world. That the air may not become noxious, it is necessary it should be in perpetual motion, and this is effected by the winds. I do not mean by gentle mild winds, but by storms and tempests, which collect the vapours from different countries; and by forming them into one mass, mix together the good and bad, and thus correct one with the other. Storms are even useful at sea. If it was not often violently agitated, the very calmness of salt water would occasion in it a degree of putrefaction, which would not only destroy the innumerable shoals of fish which live in it, but might also be very hurtful to travellers. Motion is the soul of all nature. It preserves every thing in order, and saves them from destruction. Why should the sea be excepted from the general rule, the sea which is the common receptacle for all the dregs of the earth, and wherein so many animal and vegetable substances putrefy? If the sea was not in perpetual motion, the water would stagnate, and infect us with an insupportable stench. Motion is as necessary to the sea, as circulation to the blood of animals; and the other causes which give it a gentle, uniform, and almost insensible motion, are not sufficient to shake and purify the whole mass. Nothing

but storms could answer this purpose, and we see what advantages result from them to mankind, and to all animated creatures. These are the uses of storms, and the reasons which ought to prevent us from considering them as destructive plagues and instruments of divine vengeance. It is certainly true, that storms have often sunk ships richly laden, destroyed the hopes of the farmer and gardener, laid waste whole provinces, and spread terror, desolation, and horror all around; but what is there in nature which has not its inconveniencies, and which may not in some respects prove fatal? Shall we reckon the sun amongst the evils of this world, because its situation makes the earth barren for some months, and because at other times its heat burns and dries up our grain and fields? The phænomena of nature, which ought to appear formidable to us, are only those where the advantages are none in comparison to the evils they draw upon us. But can this be said of storms, if we consider the uses which result from them? Let us then acknowledge that God has planned all with wisdom. Happy those who are convinced that every thing throughout the universe tends to the universal good, and that the very means which Providence makes use of to chastise us, are in themselves indispensable blessings, the general effect of which makes ample amends for the particular evils which may in some cases result from them!

NOVEMBER XXVIII.

ACCIDENTAL EVENTS.

PROPERLY speaking, nothing can happen by chance, for every thing has its real and certain cause. But what we call chance is no more than the unexpected meeting of several causes, which produce an unforeseen effect. Experience shews us that this often happens in life. Unforeseen accidents may entirely change the fortune of men, and overthrow all their designs. It seems, as if naturally, "the race should be to the swift, and the battle to the strong, and success to the wise;" yet it does not always happen so; for an unexpected event, a favourable circumstance, an accident impossible to foresee, often does more than all human power, knowledge, or prudence could do. How much to be pitied therefore would mankind be, if a wise and beneficent Hand did not regulate events for them! How could God govern mankind, if what we call chance did not obey his voice! The fate of men, families, and even whole kingdoms often depends on circumstances which appear to us insignificant and trifling. If we take from Providence the rule over these small events, we must at the same time suppose the greatest revolution in the world equally independent of his government. We know that accidents daily happen, on which our

temporal happiness or misery in a great measure depend. It is evident, that we cannot guard against these sort of accidents, because we cannot foresee them; but it follows from thence, that these unexpected events, which are above our understanding or prudence, ought to be particularly assigned to the will of Providence. By the wisdom or goodness of God we are left more or less to ourselves, according as we have more or less understanding, and powers to conduct ourselves rationally. But under circumstances wherein our prudence can be of no use, we may depend upon it, that God will more particularly watch over us. In all other cases, the endeavours and industry of man ought to concur with the aid and protection of Heaven. It is only on occasion of unforeseen accidents that Providence acts alone. As in all that we call chance, we visibly discover the traces of wisdom, goodness, and justice of God, it is evident that chance itself must be subject to Divine direction. It is even there that the government of Providence shines with peculiar lustre. When the beauty, order, and plan of the world fills us with admiration, we conclude without hesitation, that a Being infinitely wise must preside over it. With how much more reason ought we to draw this inference, when we reflect on the great events which are produced by accidents, which no human wisdom could foresee? Have we not a thousand examples, that the happiness and lives of men, the fate of nations, the success of wars, the re-

volutions in kingdoms, and other such things depend on accidents entirely unforeseen ! An unexpected event may interrupt projects the most secretly and best concerted, and destroy the most powerful forces. It is in Providence alone we can rest our faith, peace, and hope ; with whatever evils we may be surrounded, whatever dangers may threaten us, God can deliver us by a thousand means unknown to ourselves. The lively persuasion of this comfortable truth, ought, on the one hand, to inspire us with the profoundest respect for the Ruler of the universe ; and, on the other hand, lead us to look up to him on every occasion through life. This truth ought also to curb our pride, and to inspire the high and the mighty of this world, with the religious fear they ought to have of the great Being, in whose hands there are a thousand means unknown to us, by which the whole structure of happiness we have proudly raised, may be destroyed. Lastly, this same truth is highly calculated to banish all doubt, all care and sorrow from our minds. The infinitely wise Being has a thousand wonderful ways unknown to us. They are the ways of mercy and goodness. He wishes the happiness of his children. He commands it, and all nature obeys.

NOVEMBER XXIX

THE GREATNESS OF GOD.

NOTHING is more proper for Man than to endeavour to form to himself ideas of God, in some degree worthy his greatness and majesty. It is true, that it is as impossible for us to comprehend him perfectly, as to “contain the seas within the hollow of our hand, or to meet the heavens with the span.” God is at the same time much known to us, and much hidden from us. He is near us, and yet raised much above us; near to us as to his existence; above us, and concealed from us, as to his nature, perfection, and decrees. But it is our duty to endeavour to know him so as to conceive the sentiments of veneration so justly due to him. To assist our weakness in this respect, let us compare him with what men esteem and admire the most, and we shall see that God is infinitely above all. We admire the power of kings, and we are astonished when we hear or see, that they have conquered vast empires, taken towns and fortresses, raised stately buildings, and been the means of happiness or misery to whole nations. But if we are struck with the power of a man, who is but dust and ashes, and most of whose exploits are owing to foreign arms, how must we admire the power of God, who laid the foundation of the earth, who made the heavens, who holds the sun in his

hand, and supports the immense fabric of the universe. We are with reason astonished at the heat of the sun, the impetuosity of the winds, the roaring of the sea, the claps of thunder, and the swift flashes of lightning; but it is God that gives heat to the sun, who thunders in the clouds, who walketh upon the wings of the wind, who raises the storm, and calms the waves of the sea. We very properly respect those who distinguish themselves by the extent of their genius and knowledge; but what is all the understanding and knowledge of man in comparison with that of the supreme Being, to whom all things are known, all are visible: Who counts the stars in the sky, the sand of the sea; who knows the course that each drop of rain will take; and who, (with a single glance) beholds the past, the present, and the future, at the same moment? How much wisdom shines in the construction of the universe, in the course of the stars, in the plan of our globe, in the least worm, and in the smallest flower. Those are master-pieces which infinitely surpass the greatest and most perfect work of Man. We are dazzled with the splendor of riches, and we admire in palaces the magnificence of furniture, the luxury of clothes, the beauty of the apartments, the gold, silver, and precious stones, which shine on every side. But all this, how little is it if compared with the riches of God, whose throne is the heavens, and the Earth is his footstool. The heavens are his, the earth

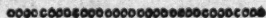
also is his, the habitable earth, and all that it contains. Life, health, riches, glory, pleasures, all that can form the happiness of his creatures, all is in his hands, and he dispenses every thing according to his good pleasure. We respect the potentates of the earth, when they command multitudes of subjects, and reign over many countries: But what is the corner of the earth, which is subject to them, in comparison of the empire of the universe, of which our globe is but a little speck, and which extends over all the stars of heaven, and all their inhabitants? How great is he to whom all the monarchs of the world are servants; and who sees about his throne cherubims and seraphims ever ready to fly or execute his command? We judge of the greatness of men by their actions; we celebrate the fame of kings who have built cities and palaces, governed well their estates, and happily accomplished great designs: But behold the works of God! the creation of the immense universe, the preservation of so many creatures. the wise and just government of the universal empire, the redemption of mankind, the reward and punishment of good and bad actions? Can any thing be comparable to the greatness of God?

NOVEMBER XXX.

MOTIVES OF CONTENT.

LET sweet content take possession of our souls. God is good. Love and mercy shine through all his works. Let us contemplate his mighty deeds. The world, and all it contains, proclaim, and are worthy of him alone. The heavens and the earth witness his power. The sun that rules by day, and the moon that shines by night, all things that have life or motion proclaim the mighty God. Consider the works of his hands. Men and brutes shew us that his glory is infinite. Even the objects that appear least in our eyes, the blade of grass, and the grain of sand, teach us to know him. Ask the mountains and the abyss, the heights of the heavens and the depths of the ocean, the winds, and the tempests, the worm that crawls in the dust: They will tell you that his wisdom is infinite, and his power wonderful. Oh! how shall we worthily praise and exalt him, to whom we owe existence and life? Our bodies, and the souls which animate them, are gifts of his hands. If we are a prey to adversity, if oppressed with sorrows, scarce do we feel the weight of them, when God enables us to support them. He comes to our assistance, and our evils are banished. O my soul thou hast long experienced this. Let me never forget it, nor give way to the fear of being deserted by a God, who cannot hate his children. Let us therefore submit to

his holy will. Let us bless him for all his dispensations, persuaded that he will accomplish all his merciful designs ; for he is great in wisdom, and abundant in means,



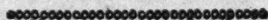
DECEMBER I.

REFLECTIONS ON MAN'S DISCOVERY OF
THE USE OF FIRE.

MONSIEUR BUFFON says, "that man, by his own ingenuity alone, produced the element of fire, which did not exist upon the surface of the earth." It is very true, that fire does not appear to be a natural production, and that it is possible the use of it might be a long time unknown; but, does it follow from thence, that man made the discovery, either by his own wisdom, or by chance. If there could be savages in the world, who did not know the use of it, they might perhaps, by chance, or in length of time, produce fire by the rubbing together two pieces of wood, or by striking a flint: But, how far is this from knowing the use of it? One might see sparks of fire, a thousand times, without understanding the nature of this element; without knowing its power of giving warmth, of expelling the horror of darkness: without comprehending how it could be made use of to dress victuals, to bake earthen ware, to boil water, or to melt metals. Pieces of wood rubbed together kindle in time; but why should a man, who is supposed not to

know the use of fire, amuse himself in rubbing wood? Supposing he should have done so without any design, he must also, without knowledge or design, have placed himself near a heap of combustible matter. Then indeed, the fire having been produced, might make him feel a pleasing warmth, but it must soon have been followed by a sharp pain; the effects of this element being entirely unknown to him. If a discovery so hazardous, and at the same time useful, had been made by a man, his name and country would have been as well known, all over the world, as the benefits that result from the discovery. We are told of a certain Prometheus; but he is accused of sacrilege, as having stolen fire from heaven. This element has been known at all times, and in all countries, and has been almost every where considered as sacred, as a gift from heaven. In some countries, they wished to keep it perpetually burning upon altars. Virgins and priests were consecrated for the purpose; which seems to prove that man was never without so useful a gift, and that he received it from the hand of God himself. Why should the Creator, whose goodness shines through all things, have made his creature to suffer such dreadful inconveniences, so capable of degrading him to the station of a brute, when it was so easy to deliver him from it? Is it not more natural to suppose, that, having taught him (as the scriptures expressly tell us) to offer sacrifices to him, this first act of obedience was rewarded by a visible sign of God's acceptance, which clouded

alone revive the hope of the sinner. And what token could be more proper than that of a miraculous fire, such as that which consumed the sacrifice at the consecration of the tabernacle, and which, by God's command, was never to be extinguished. A miraculous striking mark of divine anger exercising its just vengeance on the victim, the emblem of the sinner, but a sign full of mercy, likewise towards him, as it made him acquainted with the goodness of his almighty Father, by the gift of so useful an element, which, in all probability, he could never of himself have discovered.



DECEMBER II.

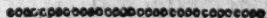
TIME IN WHICH THE WORLD AND MAN-
KIND WERE CREATED.

IF we fix the æra of the world's creation according to the Scriptures, it can scarce have subsisted above 6000 years. Those who suppose it much older judge contrary to reason, and to the historical monuments conveyed to us. The history of mankind does not go farther back than that which Moses has transmitted to us ; for all that has been said in regard to the origin of the antients is without foundation, and even their history does not go beyond the deluge. As to the chronological books of the Chinese they are visibly full of falsehoods. The Phenicians have had no historian more antient than Sanchoniaton who

lived after Moses. The Egyptain history does not extend beyond Cham the son of Noah; and the books of the Jewish lawgiver are the most ancient, as well as the most authentic of all the monuments of antiquity. If the world was some millions of years older, it must have been much more peopled than it is. Population has been constantly increasing since the deluge, and yet there might be three times as many inhabitants on the earth as there are in these days. It has been computed, that at least 5000 millions of men might live upon our globe; and yet it is not imagined that there are in reality much more than 1080 millions. In Asia they reckon 650 millions, in Africa and America 300, and in Europe 150. If we consider the arts invented by man, we find they were none of them discovered at farthest above two or three thousand years ago. Man owes his aptitude for arts and sciences, not only to his nature and his reason, but to necessity, and the desire to procure himself conveniences and pleasures; also to vanity and ambition, and to luxury the child of plenty, which creates wants. This propensity has always been observed amongst men. History carries us back to times, when even the most necessary arts were scarce invented, and those but very imperfectly known; and when they had scarce an idea of the first principles of sciences. Four thousand years ago mankind were still in a great state of ignorance upon most subjects. If we calculate according to the progress made since

then, and afterwards go back to the remotest times, we may in some degree fix the æra when men knew nothing, in other words, the birth of human kind. If their existence had been of a longer date, it would be impossible that the most useful and indispensable arts should be unknown to them for many ages. On the contrary, all that the human mind is capable of must have been discovered long ago. From this circumstance, therefore, we may again conclude, that the æra of the creation of man is that which Moses has assigned in his history. Would it not be absurd to suppose, that men could be buried in the darkest ignorance, and plunged in a kind of lethargy for thousands of years, and then awakened all at once to invent arts, to procure themselves the comforts and pleasures of life. Another circumstance should here be mentioned. Almost all Europe was formerly covered with immense forests, and very few cities or villages were seen. It must consequently have been then less peopled. Germany, for example, was but one great forest. Judge how deserted it must have been. Men could only at first sow the ground where there were empty spaces in parts of the forest. They had no separate property, and changed their habitations every year. In all Germany there was not a single fruit tree. There grew no fruit but acorns. If we would draw a comparison between the inhabitants of antient and modern Germany, we must first set aside all the inhabitants of towns and villages; consider

the numerous colonies sent from Germany into other countries; observe that most of the forests being now cut down, and turned into ploughed land, ancient Germany could scarce have had the tenth part as much cultivated as the present, and consequently could only have had the tenth part of the inhabitants it has at this time. How many millions less of people were there then! How greatly have they encreased since! And yet the forests which reach from Germany to the north-east of Asia, those that still remain in Africa and America, prove that our globe is not near as well peopled as it might be. The farther we go back to antiquity, the less peopled we find the world, and the less cultivated the earth. It is then impossible that our globe should have been eternal: for if it had been so, it must have been as well peopled as it is now from time immemorial.



DECEMBER III.

THE USE OF WOOD.

HOWEVER great, however numerous the advantages we derive from every part of a tree, yet there is none to be compared to the use we make of the wood itself. It grows in such abundance, that one might say, God every day creates new provisions of it, that we might never want any thing so essential to us. It answers every

purpose we wish. It is soft enough to take any form we please; and hard enough to keep that which is once given to it: and as it is easily sawed, bent, and polished, it furnishes us with many utensils, conveniencies, and ornaments. But these are not by any means the most important advantages; they are only for the purposes of convenience and luxury. We have wants still more indispensable, which we could scarce supply without solid, thick wood. It is true, that nature furnishes a great quantity of heavy, compact bodies: we have stones and marble of which we make many uses; but it is such labour to get them out of their quarries, to convey them to any distance, or to work them, that it is very expensive; whereas we may make use of the largest trees with very little trouble or expence in comparison. By sinking into the ground wooden piles of sixty or ninety feet long, a sure foundation is made for walls, even in loose sand or mud, which would otherwise fall in. These piles, strongly driven down, and made firm, form a forest of immoveable, and sometimes incorruptible, trees in the ground or water, able to sustain the largest and heaviest buildings. It is wood or timber that supports the brick work, and weight of tiles and lead of which the roofs of our houses are composed. Wood is also a preservative of life, as it is our chief fuel, so necessary to health and other essential purposes. The sun, undoubtedly, is the soul of nature, but we cannot steal any of its rays to dress our food with, or to melt our metals. Fire,

in some measure, supplies the place of the sun; and the more or less of it is in our own power. The long winter nights, the cold fogs, and the north wind would freeze our blood, if we were deprived of the comfortable warmth of fires. How necessary therefore fuel is to us! Was it not for the wisest purposes that the Creator of the world covered one half of the surface of our globe with wood, and yet, are we not apt to forget this? Are we sensible how much it contributes to our welfare? Or, because these blessings are too common, do we therefore think them of less importance? It is true, it is easier to acquire wood than gold or diamonds, but is it therefore less a peculiar blessing of Providence? Is it not precisely the plenty of wood, and the ease with which we acquire it, that ought so much the more to excite our gratitude? Such reflections would prove constant subjects for it, if we accustomed ourselves to this pleasing, though serious turn, of mind.

DECEMBER IV.

OBSERVATIONS ON SOME ANIMALS.

WE daily experience the different uses that animals are of to us. The Creator has formed some to associate with us, others to feed upon. All of them are designed either to supply our wants, or to serve for our pleasure. A dog is by no means a despicable creature. Exclusive of the

beauty of its form, its vivacity, strength, and swiftness, it has all the interior qualities which can attract the notice of man. It possesses strong and tender feelings, which education still improves, and which renders it worthy of being a companion to man. It knows how to promote his designs, to watch and guard him, to flatter, caress, and please its master, in many ways. Without the assistance of this faithful domestic, men could not so easily subdue other animals. In a word, it seems as if God had placed the dog among men, to serve them for companions, aid, and defence. This interesting animal merits our attention in another respect; as it is capable of things which evidently prove that it is not a mere machine, but that it has a soul within it. Of all animals the dog has most variety of language. How expressive are its signs of joy when its master returns home? How different are these from the signs it makes on the discovery of a robber, on seeing a wolf, or pursuing a hare? What cautious order, what cunning and prudence in all its motions! The advantages which accrue to us from sheep are still greater, though they have not the dog's art of pleasing. All parts of a sheep are useful to us; its milk, wool, flesh, and even its bones. This animal is remarkable for chewing the cud. As it swallows its food first in a hurry, without chewing sufficiently, it brings it up again into its mouth to chew and swallow it a second time. These animals do this because they have but one row of teeth, which defect is com-

penfated by the multiplicity of their ftomachs. They have four of them. In the firft, which is very large, and called the *paunch*, the food almoft whole and raw, is a little moistened and softened. The fecond, which is called the *cap*, is much fmaller. The food macerates better there, and the digeftion begins to make fome progrefs. From thence it paffes into the third ftomach, called the *tripe* or *leaf*, where it remains till it is properly soaked and diffolved. Accordingly, this ventricle is compofed of feveral folds or leaves, which prevent any thing from paffing which is not fluid, laftly, the digeftion is completed in the fourth ftomach, called the *runnet*. The digefted food there changes its colour from green, (which it was in the third ftomach) and becomes white as milk.—The hare neither wants inftinct for its own prefervation, nor fagacity to efcape its enemies. It makes its own form: it chufes in winter a place expofed to the fouth, and in fummer to the north. In order to conceal itfelf, it hides between ridges or hillocks nearly of its own colour. When it is purfued by dogs, it flies fwiftly ftrait forward, then turns round and comes back, throws itfelf into bye-paths, and, after a number of leaps and wheelings about, it goes and hides itfelf in the trunk of a tree or bufh. It has the cunning to change place continually, according to circumftances.—The Stag has ftill more cunning and tricks than the Hare, and gives much more trouble to the huntsman. Its elegant light form, its horns which ferve more

for ornament than defence, its height, its swiftness, and its strength, distinguish it from the other inhabitants of the woods; and it seems formed to embellish and enliven the gloom of the forests. When we reflect on these, and the innumerable multitudes of animals which inhabit our globe, and which are at our command, how gratefully should we acknowledge the goodness of God? If the earth is composed of so many different soils, it is that such a number of animated beings may find the food adapted to their nature. All lands, good as well as bad, sandy or marshy, gravel, or clay, from the banks of rivers up to the tops of mountains, are they not all filled with animated creatures, useful to us in some way or other? The remains of our tables feed the hens which are so useful to us. The delicate flesh of the pidgeon well repays the trouble of providing them with safe and proper houses. The swans clear our ponds and basins of many weeds which would corrupt there. Whole flocks of geese and ducks yield their feathers to us for our beds, and expect nothing in return but a little poor food, and a pool where they may bathe, play about, and seek worms. In a word, there is not a spot, however barren, that does not contain and feed many useful animals. Can we then ever be insensible to such numberless blessings?

DECEMBER V.

THE FORMATION OF SNOW AND ITS DIFFERENT SHAPES.

SNOW is a sort of frost. The only difference between these two meteors is, that the frost falls like dew upon the surface of certain cold bodies which draw out its moisture, and on which it remains fixed close; whereas the snow is formed before it falls, by congealed vapours in the middle region of the air; which follow the same laws in falling, as the fogs, the dew, and the rain do. The air is often extremely cold, and this cold may be considerably increased by the density of the air, and the accession of sharp vapours. It is then easy to comprehend how watery particles may be frozen; but what possibly contributes more than any thing else to freeze the air, are the clouds; for it is generally very cloudy when it snows. The thicker the clouds are, the more they intercept the sun's rays, and prevent their effect. But from the same reason must it not snow sometimes in summer? It may in reality so happen, that in the very midst of summer there may be snow formed in the higher regions of the atmosphere; but it is never so cold at that season as not to melt when the frozen vapours come down to the lower regions of air; consequently does not then appear in the form of snow. It is not the same in winter, as it is then very cold; in the lower region of the atmosphere near the

earth, the congealed vapours cannot receive heat enough in falling to melt them, and therefore they preserve their form of snow. The shape of the flakes is very remarkable. They all resemble little stars with six equal rays. It is difficult to discover from whence this regular form proceeds. Perhaps it may be imputed to the saline particles which float in the air, and by uniting with the snow, occasion it to chrysalize. Thus, the frozen vapours collecting round these saline particles, which serve as a kernel to them, become formed into hexagons. Also, when the lower air is very cold, these stars fall separately; but when the air is warmer, or more moist, they grow a little soft; and, if they happen to touch, they stick together, and form into flakes, more or less large, according as there are more or less of the little stars joined together. This is the reason that snow never falls in large flakes when the cold is extreme.

An attentive observer cannot but admire the divine Wisdom and Power, in finding that even in the flakes of snow, the most exact proportion, the most perfect regularity is preserved. How surprised should we be, were we to see them for the first time, and to be told that this brilliant meteor was only owing to some vapours in the atmosphere! How quickly the snow forms! We sometimes are surrounded with it unexpectedly. What multitudes of flakes fall from the clouds one over another, and in a moment cover the earth! While this affords pleasure to the

fight, and abundant subject for reflection, it is well calculated to justify what the pious Brooks " says, " That even frost and snow have their " charms ; and winter has its sweets. None " can want innocent and pure pleasures, but " those who are so dull and insensible, as to be " void of all reflection, and to behold ever the " works of God with indifference.

DECEMBER VI.

WINTER PLANTS.

IT is a mistaken opinion, that winter is in general destructive to plants and trees. It is, on the contrary, very certain, that the variety of heat and cold contributes much to the growth and propagation of vegetables. In the warmest climates, there are immense desarts, which would be still more barren, if the burning heats were not sometimes succeeded by cold. Winter, so far from being prejudicial to the fertility of the earth, is favourable to it. Even the coldest countries (notwithstanding their snow and ice) have plants which succeed very well. Many trees, for example, the fir, the pine, the juniper, the cedar, the larch, and the box-tree, grow as well in winter as at any other season; and this was necessary, that the forests might furnish us with enough of wood. The house-leek, pepperwort, marjoram, thyme, sage, la-

vender, the humble wormwood, and other such plants, preserve their verdure in winter. There are even some flowers which grow under the snow. The single anemony, the early hellebore the primrose, the hyacinth and winter narcissus, the snow-drop, or white winter flower, and all sort of mosses, grow green in the cold. The florists tell us, that the plants under the frigid zone, if put into a green-house, cannot bear a heat beyond 38 degrees; but, they bear cold so well, that they grow all the winter in Sweden, as well as in most of the parts of France, Germany, Russia, and the northern parts of China. The vegetables belonging to climates extremely cold, cannot bear heat, nor can those which grow on high mountains in any country. Mountains and rocks, whose tops are all the year covered with snow, are not without their peculiar plants. On the rocks of Lapland, there grow vegetables, which are also found in the Alps and Pyrenean hills, and on the mountains of Spitzburgh, but no where else. When they are transplanted into gardens, they rise pretty high, but they bear scarce any fruit. Few of the best growing plants in the northern countries can thrive without snow. Thus, we find that there is no land in the immense garden of nature intirely barren. From the finest dust to the hardest rocks, from under the line to the north pole, there is no soil which does not produce and nourish plants peculiar to it. No season is absolutely without flowers or fruit.

If we were properly attentive, to the government of Providence, we should every where find occasion to acknowledge the Divine goodness and wisdom.

DECEMBER VII.

AN EXHORTATION TO REMEMBER THE
POOR AT THIS SEASON.

THOSE who are quietly sitting in convenient chearful houses, and who hear the whistling of the sharp north wind, let them reflect on their unhappy fellow-creatures, many of whom are suffering the utmost severity of poverty and cold. "Happy those, who at this season have a
" house to shelter them, clothes to cover them,
" bread, and the fruit of the vine to refresh
" them, with a bed of down on which they may
" repose and yield to pleasing dreams. Unhappy the poor man to whom fortune refuses
" even the necessaries of life! Without shelter,
" without clothes, often stretched upon a bed of
" pain; and too modest to proclaim his wants."
We ought all to be touched with the misery of this order of people. How many poor creatures in the streets, distressed with cold and hunger! How many old people with scarce any thing to cover them, exposing themselves for hours to the inclemency of the weather, in order to solicit the charity of passengers! How many sick are there,

without food or nourishment, lying on straw, in miserable huts, where the wind, the cold, and the snow penetrate ! Winter renders benevolence to the poor the more necessary, because it increases their wants. It is not the time in which nature itself is poor ? And is it not adding double value to our benefactions to bestow them seasonably ? If we have been enriched with the summer and autumn fruits, was it not with the intention that we should share them with our fellow-creatures, now when nature is at rest. The more the cold increases, the more disposed we should be to relieve the necessitous ; to pour into the bosom of poverty all we can spare.—What other end could Providence propose in the unequal division of earthly riches, were it not to excite beneficence in the wealthy, by the affecting scenes of the miseries of the poor. Let us therefore have compassion on our fellow-creatures, and not let them suffer more than even the brutes. It is our duty to soften their evils, and Providence permits us to have a share in this. It is our duty to clothe, to feed, and to comfort them. Let us then give of our superfluity, or share our little with them. Nobody is so poor that he may not do some good. Let us enjoy the sweetest satisfaction that a noble mind can feel ; the god-like pleasure of relieving the wants of others ; of softening and lessening their weight of adversity. How easy it is to do this ! We need only retrench a few of our expences in dress and pleasures. How fit an offering would it be to virtue, were

our benevolence to be attended by a conquest over our passions, in retrenching the indulgence and luxury of vanity, in order to bestow our charity on the poor !



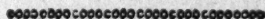
DECEMBER VIII.

NATURE IS A LESSON FOR THE HEART.

WE gain, in every respect, by studying nature ; and it may, with reason, be called a school for the heart, since it clearly instructs us in our duty towards God, our neighbour, and ourselves. Can any thing inspire us with more profound veneration towards God, than the reflection that it is he who has not only formed our globe from nothing, but whose almighty hand also confines the sun within its orb, and the sea within its bounds ? Can we humble ourselves too much before the Being who created the innumerable worlds which roll over our heads ? What are we in comparison to those immense globes, and how little must the earth in all its glory appear, when considered in that light ? Must we not shudder at the very thought of offending this God, whose boundless power we every moment see proofs of, and who with a single glance can destroy or make us wretched ? But the contemplation of nature is highly calculated to fill us with love and gratitude towards its Author. All nature loudly proclaims this comfortable truth, that *God is love*. It was,

love which induced him to create the world, and to communicate to other beings the felicity which he himself enjoys. For this purpose he created the universe, and an innumerable multitude of creatures, that all of them, from the archangel to the worm, should feel, each according to its nature and capacity, the effects of Divine goodness. Is there in reality a single creature, which does not furnish proofs of this immense goodness? But particularly, if we reflect on ourselves, how many may we not find? The Creator has endowed us with reason, not only to enjoy his blessings, but to acknowledge also the love with which he honours us, and which enhances infinitely the value of his favours. He ordained that we should have dominion over the animals, to make them subservient to our wants and conveniences. It is also for us that the earth produces fruit in such abundance. So many blessings daily enjoyed, and to which we owe the continuance of our existence; the disinterested love of this great Being, who can receive no return from his creatures, and whose felicity can admit of no increase; can we be insensible to all this? Must it not excite the most grateful love for our bountiful Creator? I cannot conceive it possible for mean and selfish sentiments to fill the heart of a man, who, in the contemplation of nature, must every where discover traces of infinite beneficence in the Supreme Being, who does not less propose the happiness of each individual, than the universal good of the world. If we reflect

on the ways of Providence, the heart must be depraved to a very great degree, which is not inspired to imitate, as much as possible, such universal benevolence: For, "God maketh his sun to rise on the evil and on the good, and sendeth rain on the just and on the unjust." Can we then exclude any from our charity: Lastly, when we reflect on the admirable order, which reigns throughout all nature, ought it not to produce the best dispositions in our minds? If we are convinced that nothing can be pleasing to God, which is contrary to order and regularity, should we not conform to it? How unpardonable to oppose, by our irregularities, the merciful designs of Providence in our favour? Ought we not to second them, by our endeavours to correct ourselves? It is by these means that nature becomes an excellent lesson for the heart. If we listen to it, we shall learn the true wisdom which leads to everlasting happiness.



DECEMBER IX.

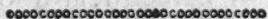
GOD'S GOODNESS TOWARDS US IS SHEWN
IN THE VERY THINGS WHICH APPEAR
HURTFUL.

MOST people wish that they were not exposed to any evils in this world. If they had their choice, they would endeavour to secure to themselves a life free from all cares. But is

It true that we should be really happy if nothing ever so trifling was to disturb our tranquillity, or if, through our lives there was to be novicissitude of sad or pleasing events? This question, on the decision of which depends our peace in this world, is worth examining; while we should, at the same time, guard as much as possible against the illusions of self-love.—Should we be really happy here if we enjoyed uninterrupted good fortune? I do not believe we should. A constant state of happiness would soon grow insipid, and this disgust would change our felicity into a real evil. On the contrary, the evils we sometimes meet with enhance the value of our blessings, as colours are relieved and set off by shade. If there was no winter, should we be as sensible as we are of the charms of spring? Should we know the value of health without sickness, the sweets of repose without labour, the peace and consolation of a good conscience, if we had never been tried and tempted? The more obstacles there are to our happiness, the greater our joy when we surmount them. The heavier our misfortunes are, the more happy we feel when delivered from them. Besides this, if the distresses we complain of were not to happen, we should be exposed to much greater evils. If all our days were prosperous, we should give ourselves up to luxury, pride, and ambition. If we were never pressed to it by necessity, nobody would take the trouble to be active or laborious in business; nobody would make use of their talents, nor cultivate their mind; nobody would be animated with zeal for the public good.

If we never were liable to danger, how should we become prudent, how should we learn compassion? If we had no evils to fear, how easily should we be intoxicated with happiness, and forget our gratitude to God, charity towards our neighbour, and all our duties in general? Are not then these virtues, these blessings of the soul, a thousand times preferable to a constant train of pleasing sensations, which would also become dull and insipid to us by possession. He who reposes always in the lap of felicity, soon grows negligent of doing good, and is incapable of any great action; but let him feel the strokes of adversity, and he will recover his wisdom, activity, and virtue. How unjust and inconsistent are the desires of man! They wish to live quiet, contented, and happy, and they object to the means which lead to it. In the heat of summer, we sigh for coolness; and yet we are displeased when we see the clouds collect which are to obtain this for us. Thunder storms purify the air, and make the earth fruitful; yet we complain that the flashes of lightning terrify us. We acknowledge the use of coals, minerals, and baths, but we do not like earthquakes. We wish that there should be no infections or epidemical disorders, and yet we complain of the storms which prevent the air from corrupting. We love to be attended by servants, and yet we wish there was no poverty or inequality of situations. In a word, we wish in most things for the end, without the means. Let us acknowledge the wise and beneficent de-

signs of God, even when he permits frequent alternatives in our lives, from joy to sorrow, from happiness to misery. Is he not the arbiter of our fate? Is he not our Father, whose goodness we ought to be convinced of, even when he thinks proper to chasten us? Are we not in a world subject by nature to revolutions? Have we not often experienced, in the course of our lives, that what our ignorance made us consider as an evil, has in reality proved a happiness to us. Let us then receive with calm resignation from the hands of God, the evil he may think proper to inflict. They will only appear terrible at first; the longer we are used to them, the more supportable we shall find them, and the more we shall feel their salutary effects. If in our adversity we are patient, with faith and hope, we shall come at last to bless God for the trials he sends us. In a future state, we shall undoubtedly do so, and shall form a very different opinion of the troubles we have undergone in this world. We shall then be convinced, that, without these afflictions which we now lament, we should never have obtained the happiness designed for us hereafter.



DECEMBER X.

ACCIDENTAL REVOLUTIONS ON OUR GLOBE.

NATURE every day produces of itself changes on the surface of the earth which affect

the whole globe. Many ancient monuments prove, that its surface in several places sinks down more or less; sometimes quicker, sometimes slower. The wall built by the Romans in Scotland, in the second century, which went across the whole kingdom from sea to sea, is at present almost entirely under ground; and there are remains of it every day still discovered. The mountains, those pillars of the earth, are exposed to the same overthrow, occasioned either by the nature of the ground, the waters which undermine and sap them, or by subterraneous fires. But when some parts of the globe sink down, there are others, on the contrary, which rise up. A fertile valley at the end of a century may be converted into a marsh, where clay, turf, and other substances, form beds one over another. Lakes and gulphs turn into land. In stagnant water there grows a quantity of rushes, sea-weed, and other plants. The animal and vegetable substances, by corrupting in it, gradually form a sort of mud and mould; and the bottom at last rises so high, that what was formerly water becomes dry land. The subterraneous fires also produce great changes on our globe. Their effects are shewn by three different commotions, which are generally felt separately, but which sometimes come altogether. The first consists in a horizontal motion back and forward. When these are violent and uneven, they throw down buildings, and overturn every thing. These undulating commotions are particularly observ-

ed in waters. There are other earthquakes called pulsation, or lifting up. They sometimes cause new islands to rise all of a sudden from the bottom of the sea. The crust of the earth being lifted up with great violence, falls down again, sinks in deeper, then breaks, and forms lakes, marshes, and springs. Lastly, there are explosions like the springing up of a mine, with eruptions of inflammable matter attending them. These violent shocks and convulsions occasion great devastation, and considerable alterations on the surface of our planet. The outer coat of the earth breaks in different places, sinks in on one side, and rises up on the other. The sea also partakes of these commotions; and the most sensible effect that appears from them are the new islands which rise up. They are produced by the bottom of the sea being raised up; or they are composed of pumice stones, of calcined rocks or other substances thrown out from some volcano. History informs us, that by earthquakes, which subterraneous fires occasioned, whole cities have been swallowed up, and sunk sixty feet under ground; so that afterwards the earth which covered them was sowed and cultivated. Several of the alterations produced on our globe have been caused by the undermining of waters. Heavy rains soak into the mountains; soften and loosen much earth from them; which being swept away into the sea and the rivers, raise the bottom of them considerably. The course of water is often divert-

ed. Even the banks change their place. Sometimes the sea retires, and leaves whole continents dry, which used to be its bed. Sometimes it overflows land, and covers whole countries. Kingdoms that were formerly close to the sea, are at present removed to a great distance from it. The anchors, the great iron rings to moor vessels, and the wrecks of ships found upon mountains, in marshes, and at a great distance from the ocean, prove beyond a doubt, that many places which are now terra firma, were formerly covered by the sea. There is every reason to believe, that England was formerly joined to France: the beds of earth and stone which are the same on both sides of Calais, and the shallowness of that strait seem to prove it.—

Climates even occasion great revolutions on our globe. Between the tropics the heat and rains take their turn, six months of each successively. Countries nearer the pole are liable to great change by the severity of cold. In autumn, the water penetrates through a multitude of little crevices into the rocks and mountains. It freezes there in winter, and the ice dilating and bursting causes great havock. Such revolutions produced by accidental causes are evident proofs that the world itself is frail. It also proves that God is not an idle spectator of the alterations our globe undergoes, but that he plans and directs the whole by laws infinitely wise. From hence too we may learn that all things here are subject to constant vicissitudes. We may even observe

that frequent accidental changes give a new face, not only to the inanimate, but to the animated part of the creation. One generation gives place to another. Amongst men, there are some who rise, while others fall: Some are raised to honours and dignity, others sink into poverty and contempt. There are continual migrations and change of situation amongst creatures; visible differences and gradations in their condition and faculties. God has allotted to all beings different periods of duration. Some are designed for a short and momentary existence; others for a longer; and some for an everlasting life. In all this, how evidently does the wisdom, power, and goodness of the Creator appear!

DECEMBER XI.

SENTIMENTS OF GRATITUDE ON THE REFLECTION OF THE CLOTHING PROVIDED FOR US BY PROVIDENCE.

THE goodness of Providence appears even in our clothing. How many animals bestow upon us their skins, their hair, and their fur, for this purpose! The sheep alone, with its wool, furnishes the most necessary part of our dress; and, it is to the valuable labour of a worm that we owe our silks. How many plants also do we find of use in this respect! Hemp and flax furnish us with linen, and many different textures

are formed of cotton. But even those vast stores of nature would be insufficient if God had not endowed men with industry, and with an inexhaustible fund of invention, to contrive and prepare clothing of many sorts. When we reflect on all the preparations for making linen, we shall find how many hands are necessary for a few yards only. It seems as if we should be but little vain of dress, as we must have recourse for it, not only to the animals most contemptible in our eyes, but also to the rank of people our pride disdains the most. But why has the Creator obliged us to provide ourselves with clothing, while every animal receives theirs directly from nature? We may answer this question, by saying that it is for our good. It is, on one hand, useful to our health, and, on the other, adapted to our way of life. We may, by these means, suit our dress to the different seasons of the year, the climate we live in, the situation and profession we have chosen. Our clothes promote insensible perspiration, so essential to the preservation of life. The necessity of obtaining them for ourselves exercises the human mind, and has given rise to the invention of many arts. And lastly, the labour it requires furnishes subsistence for a number of trades persons. We have, therefore, great reason to be content with this plan of Providence. Let us only take care not to frustrate the designs proposed by it. A good man ought never to glory in the outward ornaments of his body, but rather in the inward qua-

and be employed in the service of man. The thick fur of some animals not only guards them from wet and cold, but serves them also to cover their young, and make soft beds for them. For birds, and some sort of insects, feathers were the best clothing. Besides protecting them from cold and wet, they are arranged in the manner most proper to support them in the air. The feathers for this purpose cover the whole body, and their construction is so delicate as to be favourable to the bird's flight. Light and hollow, the quills are filled with a sort of marrow which strengthens them; and they are rendered thick enough for warmth by filaments finer than hair interwoven with much art, which not only guards them from the inclemency of the weather, but gives a proper substance to the wing.—The clothing of reptiles is perfectly suited to their way of life. Observe, for example, the earth-worm. Its body is composed of a succession of little rings; each ring is furnished with a certain number of muscles, by means of which the worm can extend or contract its body very much. These insects have under their skin a gluey juice, which perspires and makes their bodies more easy to slip under ground, which they could not do, if they were covered with hair, feathers, or scales. The substance with which the aquatic animals are covered, is equally fit for the element they inhabit. Fish could have no clothing more convenient than scales, the form, hardness, size, number, and position of which

are perfectly adapted to their way of living. It is the same with the shell-fish. They could not be better clothed and housed than they are. The beauty also of all this clothing is singularly remarkable. Even the most disagreeable creature has some peculiar beauty; but it is on some of the birds and insects which the Creator has lavished most ornaments. If we observe the butterflies, their beauty must strike us with surprise and admiration. Some are clothed plain, and all of one colour. Others are a little adorned, and others shine with the greatest variety of the brightest colours. How much also has nature diversified the beauty and plumage of birds! The little *colibri*, an American bird, is one of the wonders of nature. It is no larger than a great fly, but of so beautiful a plumage, that its head and wings resemble a rainbow. Its neck is of a bright ruby red; the belly and under part of the wings are of a gold colour; the legs green as an emerald; the claws and bill black and polished as ebony. The males have a little tuft on their heads, composed of all the colours of the rest of the body collected together, which are worn as ear-rings by the Mexican women. It is impossible not to suppose, that in the covering of birds God had in view their convenience, use, and beauty. Each animal has what best suits it. Nothing superfluous, nothing wanting; every thing so planned, so compleat even in the lowest creatures, that the whole art of man could not imitate it. Does not this forcibly prove the

existence of a Being whose infinite wisdom unites with unlimited goodness, to render each creature as happy as its nature and design will admit of?

DECEMBER XIII.

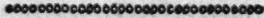
THOUGHTS UPON THE RAVAGES OF
WINTER.

I HEAR the winds and the tempests roar. My blood is frozen in my veins. The darkness of the day, its light almost extinguished, a disposition in myself to terror and fright, all concur to make this tumult and disorder in nature appear the more dreadful. How often has the wind blown down cottages and even palaces; thus, in a moment destroying the labour of years. How often has it plunged into the abyss, ships, and the unhappy being who hazarded their lives on such frail foundations! How often has it torn up by the roots the stately oak! But thou, O God? art the Creator and Ruler of all things. The tempest and the northern blast are thy messengers, the heralds of thy power, and the ministers of thy will. They ought to lead us to adore and to fear thee. If thou didst not set bounds to their destructive power, they would, every where, and at all times, occasion the same mischief; and yet we behold the poor cottage, which nothing shelters from their fury, still standing. Thanks to

the divine power, which rebukes the winds and the sea. Thanks to that wisdom which has ordained all for the best. In the mean time, some may ask, why the mischief which storms and tempests occasion should be permitted, if the world and all the events of it are the work of infinite wisdom? Can perfect wisdom produce any thing but order? Perfect goodness any thing that is bad? It is thus that frail humanity may reason. But what is man, that he dare dispute with God? "Shall the creature say to his Creator, Why hast thou made me thus?" And, because we cannot comprehend the works of God, does it therefore follow that they are defective? In order to judge of them, and of the purposes for which they were designed, we should equal him in knowledge and wisdom. It is a miracle even that we are able to perceive part of the order he has established, or to take in any of this wise and extensive plan; and, considering our want of understanding, that things do not appear still more confusedly to us. Alas! all would be disorder and confusion; there could be neither order, harmony, or happiness in the universe, if there did not exist a Being, whose wisdom, goodness, and power, surpass all our conceptions; who created the world and all things in it. If the general plan and common course of nature visibly tend to the welfare of all created Beings, whatever particular accidents may seem to contradict this design, only prove our ignorance and limited understandings. To form one whole out

of the materials of which this visible world is composed, wherein such magnificent phenomena appear, wherein are displayed the several beauties and treasures of knowledge, virtue, and felicity, which we behold in it, is a work so wonderful and divine, as none could have conceived or executed, but an omniscient, almighty, and perfect Being. The farther we advance in the researches of nature's works, the more clearly we distinguish the wisdom and goodness which governs the whole. From these principles, we shall judge very differently from what we should otherwise do, in respect to the complaints we make of winter. Even the storms, the snow, and the hail, all that appears, at this season so disagreeable to us, is linked with the everlasting order of things. There is reason in all; the exact time is allotted for every thing: and, by means of these revolutions, divine wisdom keeps up harmony throughout the immense universe. The wind, which frightens the mariner at sea, drives the waters upon barren lands. The sulphureous vapours, salt, and other matter, carried by the wind from one country to another, refresh the earth, and restore fertility to the stubble fields exhausted by the harvest. Thus the winter, which appears to destroy, gives strength to our fallow-ground for new harvests. At present the ground, the garden, and seeds, rest, buried under ice and snow; the inhabitants of the forests howl more hideously; the wild beasts are pressed with hunger; the whole world appears dead.

But God preserves it, under this appearance of death he watches over fainting nature. What miracles he performs in the midst of the frightful scenes of winter! He supports the poor from cold or hunger. The sparrow, which finds no food at present, lives however in its retreat upon the gifts of God's beneficence. The earth no longer produces any thing; but *his* hand, which is never closed, procures us food, and calls to existence things which are not yet in being.



D E C E M B E R XIV.

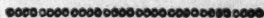
THE SAGACITY OF ANIMALS IN FIND- ING MEANS OF SUBSISTENCE FOR THE WINTER.

TH E R E are some animals that lay up stores for winter, and in the harvest-time prepare provisions for six months. It might be supposed they foresee a season, in which they cannot gather food, and that, guarding against future wants, they can calculate how much they and their families would require. The bees are almost the only insects which lay up provision for the winter. They are wonderful œconomists of their wax, because they can gather no more when the season for flowers is over, and have then no resources for subsistence, or for making their cells, but what they have already collected. They have also the prudence to gather another

kind of substance, which they require to keep out the cold from their hives. It is a sort of glue they extract from the flowers and from bitter plants, with which they closely stop up all the holes in the hive. Their œconomy appears in the very smallest things. They let nothing be lost; and what they do not want at the present they lay up for the future. Those who have narrowly observed them assure us, that, when in winter they uncover the honey-combs, they carry off the wax with which their cells were shut up, and lay it by for future use. Amongst the four-footed animals, the field-mice are those which lay up winter provisions, and, in harvest time, convey a quantity of grain to their subterraneous habitations. Mag-pies and jays are the birds which collect for the winter. They gather heaps of acorns in autumn, which they keep in the hollow parts of trees. The animals that sleep all the winter make no provisions, as they would be useless; but the others are not content with providing for the present moment, they think also of the future; and, it has never been observed, that they failed in collecting a sufficient quantity for that time. These œconomical cares cannot be from reflections, for that would be to suppose animals endowed with much more intelligence than they really have. In fact, they only think of the present, and of whatever affects their senses either agreeably or disagreeably. If the present influences the future, it is without any design or consciousness of theirs. How, indeed, can

there be supposed any foresight or reflection in this instinct of animals, when they have no experience of the changes of seasons, or the nature of winter; and when, having no idea of measuring time, they neither know when winter will come, or how long it will last. Nor can they be supposed to have any reason, or ideas of futurity, nor to seek means of subsisting, during the severe season, from reflection, since they always act invariably the same, and each species follows constantly and naturally the same method, without having been taught. For example then, when the industrious bees go on collecting honey and wax, filling their magazines with it as long as the season permits, it is not because they foresee that there will come a time in which they cannot gather. Such foresight cannot be attributed to them. How should creatures who have none but mere sensual preceptions judge of the future? Every thing is so ordered, that the bees find themselves provided without having thought of collecting it. Nature prompts them to gather wax and honey. They labour during the fine weather, and when winter comes they find their magazines full. These animals, like all others, act blindly, and almost mechanically, without reflection or design, though they appear to be led by the rules of wisdom and prudence. Being then void of reason, this wise œconomy, this appearance of foresight and reflection, must necessarily be the consequence of a superior intelligence, whose views they fulfil without knowing

it. In this consists part of our superiority over the brute creation. We can represent to our minds the past and the future. We can act from reflection, and form plans. We can be determined by motives, and chuse what best suits us. But how important is it that we should make a good use of these prerogatives! Informed as we are of the great revolutions which await us, and being enabled to look forward to the winter of life, ought we not to lay up for ourselves consolations, and resources, which may render the latter end of it not only supportable but happy? Nothing is more miserable than an old person who has passed his best days with a careless indifference about futurity, and finds himself in the winter of life void of every resource or comfort. Will not such reflections lead us to take early measures for our happiness, not only in old age, but in a future state?



DECEMBER XV.

THE ADVANTAGES OF WINTER.

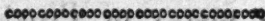
LET us reflect on the blessings God grants us at this season which appears to us so severe. The frost and cold prevent many hurtful vapours in the higher regions of the atmosphere from falling upon us, and even purifies the air. Far from being always bad for our health, it often strengthens it, and preserves the humours from

putrefaction, which a constant heat would certainly occasion. If the vapours which collect in the atmosphere were always to fall in rain, the earth would be too soft and wet, our bodies would be too full of humours and too much relaxed; whereas the cold braces and promotes the circulation of blood. In very hot countries, and where the winters are rainy and wet, serious and mortal diseases are much more frequent than elsewhere. We are told by travelers that in Greenland, where the ground is covered with mountains of ice, and where in winter the days are only four or five hours long, the air is very wholesome, clear, and light; and, except a few complaints in the chest and eyes, (occasioned partly by the quality of the food) they have seldom there the disorders so common in Europe. It is also certain, that the constitution of the human body varies according to the different climates; consequently, the inhabitants of the northern countries have constitutions adapted to extreme cold, and are generally strong and robust. As man, though active by choice, and though labour is necessary to him, is still glad to interrupt his employments to taste the sweets of sleep; so also our nature yields to the change of seasons, and takes a pleasure in it, because in reality it contributes towards our welfare and happiness. Behold our fields and gardens! They are indeed buried in snow; but this is necessary, in order to preserve them from the cold, as well as to prevent the grain from corrupting. The ground

requires rest after having yielded in the summer all that we want for the winter. Let us then acknowledge the wise ordinance of God. If our present support had not been provided for; if in this severe season we were obliged to cultivate the earth, there might be some foundation for our complaints. But our provision is made; all our wants are supplied, and we enjoy a repose suitable to the season.

God has given industry to mankind, which is necessary to keep them from cold or frost. Their inventive mind has afforded them means of procuring an artificial warmth, from which they enjoy in their apartments some of the comforts of summer. The mercy of Providence is no less visible in the yearly produce of wood and its astonishing increase, than in the fertility of our fields. We have also at this season multitudes of creatures at our command, to make it tolerable to us. The colder the countries are, the more of those useful animals are found, whose furs are designed to keep us warm. Is it not evident that divine Wisdom foresaw the several wants of the different countries, and designed to relieve them by placing animals in them which could not live any where else? Our beasts of burden bring us the necessary provisions; and it is remarkable, that our cattle are generally fruitful in the time we most require it. Winter does not interrupt trade, nor the exercise of professions. The rivers have lost their fluidity in many places; they are become hard as iron; the surface is closed

and covered with ice. This facilitates the intercourse between the inhabitants which were before divided. They are not condemned to inaction or idleness at this season ; and though they are obliged to interrupt the labours of the field, they have a thousand ways of employing themselves usefully in domestic life. The sleep of nature prompts them to look into themselves. Man is now at leisure in his calm retreat to cultivate his mind, to examine his own heart, to correct his faults, and to lay up treasure of good works. Happy they who make so good an use of this season !



D E C E M B E R XVI.

T H E E L E M E N T S.

WHETHER we consider the universe, (taken in the whole) or examine the different parts of it separately, we shall find equal reason to admire the power and wisdom of the Creator. It is true, that we can but imperfectly know any thing, and can seldom go beyond conjecture and probabilities. But this is sufficient to prove to us, on one hand, the greatness of God, and on the other, the weakness of our reason. Perhaps all the elements are of the same nature, and may be reduced to one only. Perhaps they are so combined as to form but one whole. But it would be very difficult for us to imagine this to

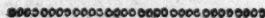
ourselves. We must divide them in our minds, and consider separately the primitive parts of which they are composed. What variety of wonderful properties in the *air*, which we every moment breathe? With what force it divides and dissolves all sorts of substances, contracting, at the same time, their different qualities! The vapours and exhalations, without number, the millions of different smells, the volatile salts alkaline and acids, the many combustible oils and spirits, which blend and unite with it, make it sometimes hurtful, but in general wholesome and good. Those foreign particles with which the air is loaded, its elasticity, the quality it has of rarifying, of condensing, and of recovering its natural state, produce those meteors which disperse the noxious vapours, purify the earth, and promote the vegetation of plants. And, though the effects of the air are sometimes dreadful, they are absolutely necessary to prevent the earth from becoming a barren desert. There are, however, in this element, as in all God's works, impenetrable mysteries. Who, for example, can explain how the particles of air, though so subtil as to be invisible to us, are the means by which every other object becomes visible! What is more wonderful than the balance between the outward air and that which is within us; a balance on which our life and preservation depends? Can we sufficiently admire, that one and the same element should transmit sound, smell, and light to us? There is a great conformity between

air and *water*. Its effects are no less variable or admirable. How many different qualities has God given to this element! All the abundance and salubrity of the air, all the richness of the earth, or warmth of fire, would not save us from perishing, if we were without water. How many changes it is susceptible of! What gave it the property of dilating, or separating, and of becoming so volatile as to rise to the height of a league up into the atmosphere, to swim in it, and to form into fogs and clouds? What gave it the power of penetrating into plants, of coming out of them again through insensible pores, and of spreading all over our fields and vallies, in the form of a refreshing dew? How astonishing is the property it has of becoming sometimes lighter than air, though a quantity of water is nearly nine times heavier than an equal quantity of air; of resuming afterwards its natural weight, of fixing to other bodies, of dissolving the most compact substance, and of mixing even with fire. Of all the elements, there is none we know so little the nature of as *fire*. It is too subtile for sight, but its qualities, properties, and effects, are visible enough. Whether the essence of fire consists in motion only, or in the fermentation of what we call inflammable matter, or, (which many experiments render probable) whether it be simple substance, different in its nature from all other bodies, still it is certain, that the prodigious quantity of it, its uses, its wonderful effects, deserve all our attention. There is nothing,

however cold, which does not contain fiery particles, that shew themselves when they are warmed by any violent motion. Fire exists every where. It is in the air we breathe, in the water we drink, and in the earth which nourishes us. It is a part of the composition of all bodies; it goes through their smallest pores; it unites closely with them; it moves with them from one place to another; and, however wrapped up, however confined it may be, it still forces itself to be seen and felt at last. With what power it dilates the surrounding air, whilst the air in its turn keeps up the fire, and makes it more alive and violent. Fire gives fluidity to water, fertility to the earth, health to mankind, and life to all animals. The *earth*, when pure, is distinguished from other bodies by having neither taste nor smell, by not being soluble, either in water or spirits of wine, and being easily bruised between our fingers. At first sight, it appears very different from any other element, and yet it has so much conformity with them, that there are naturalists who believe that water is nothing but dissolved earth, and that the earth is only water grown thick and condensed. According to their system, the water constantly diminishes upon our globe, and forms by degrees compact bodies; because that formerly our planet was only a wet and fluid mass, and that, in still more remote times, the whole was water.

All the elements are necessary to our existence and preservation; and there are none which are

not admirable, if we reflect on their properties and the variety of effects they produce. How many properties, different from each other, has not God communicated to his works! How many agents in the heavens, and upon earth, always in motion, for the preservation of the universe in general, and of each individual in particular! What revolutions! what phenomena are produced, by the combination only of the elements! It would be easier to number God's creatures than to number the acting powers. But what must be the power from whence all these proceed! They all depend upon the will of an almighty Creator. He has realized them all. He has impressed upon them a constant, uniform, and salutary motion. It is he who maintains the elements in that equilibrium to which the world owes its preservation.



DECEMBER XVII.

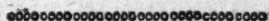
THE SUN'S INFLUENCE ON THE EARTH.

THE sun is the principal cause of all that happens upon the earth. It is the constant source of that light which is so profusely spread over our globe. This light of the sun is the most subtle fire. It penetrates into all bodies, and puts all their parts in motion. It attenuates and separates them. It dissolves those that are solid, rarefies still more those that are fluid, and renders

them fit for an infinite number of effects. Is it not evident, that on this variety of influence which the sun has on other bodies, depend all the phenomena, and all the revolutions of the globe even in the smallest circumstances? When the force of the sun's light increases, that is to say, when the rays fall less obliquely, and in a greater quantity, on a given space, and that they act longer each day, as is the case in summer, this must necessarily operate more considerable changes both in the atmosphere, and on the surface of the earth. When the rays fall more obliquely in the same space, and consequently are weaker, and in less quantity, and the days being shorter, their effect is shortened also; as in winter, how different is the face of the earth, and what a change is observable in the atmosphere? What a gradual difference appears, when from the remotest line the sun begins to draw nearer and nearer to the equinox till the days and nights become of equal length? And how many new phenomena appear when that luminous and active body retrogrades in summer from the tropic of Cancer towards the line, till the days and nights become again equal in autumn, and the sun removes from our zenith? It is on the distance of this body that depend all the variations we observe in the vegetation of plants, and the interior constitution of bodies in all climates, and at every season. This is the reason that each season and climate have plants and animals peculiar to them, and that the progress of vegetation is more or less rapid,

and the natural productions of longer or shorter duration. But it would be beyond our powers, not only to describe, but even to point out the different effects of the sun upon our earth. All the changes and revolutions of the globe have for principle the influence of the sun, as the several degrees of heat and cold depend chiefly upon it; I say *chiefly*, because the nature of the soil, the mountains more or less high, and their different situation, may also contribute something towards a country's being more or less cold, more or less subject to rain, wind, and other variations of the atmosphere. But it remains undeniably certain, that these accessory causes would not be sufficient to produce the effects observable in many places and times. For certainly these effects would not be produced, if the heat of the sun did not act in the manner it does. It requires but very little attention to be convinced of the many and sensible effects of which the sun is the principle. Its influence appears daily. Sometimes it rarefies, sometimes it condenses the air: Sometimes it raises vapours and fogs, and sometimes it compresses them together, in order to form them into different meteors. It is the sun which gives circulation to the sap in trees and vegetables, which causes the leaves and blossoms to shoot, and ripens the latter into fruit. It animates all nature. It is the source of that vivifying warmth which gives to organized bodies the power of unfolding themselves, and of growing to perfection. It operates even in the depths

under ground, where it produces metals, and gives life to animated beings. It penetrates into rocks and mountains, and its influence reaches to the very bottom of the sea. This alone would convince us of the power of our Creator. But if we consider with how much art God has drawn numberless great effects from one and the same instrument, and from the heat of the sun thus produced so many phenomena of nature, we should be more and more sensibly persuaded that nothing but infinite wisdom united with boundless power could work such wonders. Would mankind deserve to be cheered by the sun, if in these beneficent effects of its influence, they did not acknowledge the glorious perfections of the Being of Beings, and adore him with the profoundest veneration?



DECEMBER XVIII.

WINTER RAINS.

HOW different are these cold rains, which fall at this season, from those warm refreshing showers, which, in summer, embellish and fertilize the earth. This change gives a melancholy appearance to all nature. The sun is veiled from us, and the whole sky appears like one immense cloud. We cannot see at any distance. We are surrounded with a gloomy darkness, and are threatened with storms. The clouds at last burst,

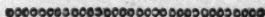
and deluge the earth. The air seems an inexhaustible reservoir of water. The rivers swelling, break their banks, and overflow the country. However disagreeable and grievous this weather may appear to us, we must acknowledge it is for wise and beneficent purposes. The earth, in a manner exhausted by its fruitfulness, has occasion to recover its strength, and for this end not only requires rest, but moisture also. The rain, waters and revives the barren dry land. The wet penetrates and reaches down to the roots of the plants. The withered leaves, which fall on the ground, corrupt and become excellent manure. The heavy rains fill the rivers up again, and furnish the springs with water. Nature is never idle. It is constantly at work, though not always to be seen. The clouds, by letting rain or snow fall continually from them, prepare for a fruitful year and an abundant summer. When the heat of the sun occasions drought, the plentiful springs, which the winter rains had formed, spread abroad, and water the fields, and vallies, creating fresh verdure all around. Thus, the wise Creator provides against the future; and what appears to us an evil, becomes the source of the beauties and treasures which spring and summer lavish on us. The gifts granted us by these means are as innumerable as the drops which fall from the clouds; and when Man, (still blind and ignorant) murmurs most, he ought to be most thankful. Eternal Wisdom invariably continues to complete his beneficent designs. Our prefer-

vation is the principal end that God proposes in watering the earth with rain. But Divine Wisdom knows how to unite different designs, and make them subordinate to each other; and, from their proper combination, results the order and harmony of the universe. Thus, the animals which exist not only for mankind, but for themselves, as they require to be supported and fed, it is for them, as well as for us, that the rains descend from the clouds to make the earth fruitful. But here, as in every thing else, we discover the wisest œconomy. All the vapours which daily rise from the earth are collected and preserved in the atmosphere, to be restored again to it, either in the form of little drops, heavy rains, or flakes of snow, according to the occasion, but still with œconomy, and never letting abundance degenerate into prodigality. Every thing is made the most of. Even the smallest sprinkling, light fogs and dews, all contribute to make the earth fruitful. But in vain would the vapours rise, in vain would the clouds be formed, if nature had not furnished winds to break and to disperse the clouds on all sides, to convey them from one place to another, to water the ground where it requires moistening. Here, one country would be deluged with continual rains; there, another would suffer all the horrors of drought. The trees, herbs, and corn, would perish, if the winds did not drive the clouds to the places allotted to the rain to fall. God says, Let there be snow on the earth, and it falls in flakes; and, when he says:

from the moon has no sensible influence upon the earth, or the atmosphere, the light of the planets and fixed stars must have still less. If it was supposed that other matter issued from the stars, and reached us, it would be without the least foundation; for, if these illapses were real, they would, when collected in a burning glass, produce some alteration or sensible change in earthly bodies, which experience contradicts. Of course then, there proceeds nothing out of the celestial bodies but the faint light they convey to us; therefore, the astrologers, whether they are weak enough to be themselves deceived, or mean to impose on others, they deserve nothing but contempt, when they tell us of a beneficent Jupiter, a malevolent Saturn, a witty Mercury, of Mars inspiring warlike positions, and Venus inclining to love. The planets far from producing the effects ascribed to them by astrologers, have in general none of any sort. What shall we say then of the Pleiades which bring rain, the impetuous Orion which foretels storms, the sad Hyades, the setting of the Arcturus, and the rising of Capricorn, which presages hail and hurricanes? What influence can the constellation the Bull have on peas and beans? or the Dog-star in respect to the madness of dogs? What connection can there be between our harvest and the Scorpion? As for the rest, if the rising or setting of these constellations was only observed in order to know the proper times for the different parts of agriculture, and not as the causes of

natural things, it might be allowable. In the earliest times, the beginning, middle, and end of each season, was not marked by months, but by the rising and setting of the stars, in conjunction with the sun, or by their immersion into, and their emergence out of its rays. From thence proceeds the vulgar opinion, that the different aspects of those stars produced effects which in reality should only be imputed to the seasons, and consequently to the sun. Orion rises in autumn, and sets in winter, which gives occasion to say, it brings storms; while it is to autumn and winter in reality they belong. The rising and setting of Orion only marks the time of those seasons.—When the Dog-star rises with the sun, it is exceedingly hot in our zone, but that constellation is not the cause of it. These heats are occasioned by our sun being then at the highest. I say *our* sun; for in the opposite zone, when the Dog-star rises with the sun, it is so extremely cold as to freeze animals, and to cover the rivers with ice. So that the southern nations consider this constellation as the cause of cold instead of heat. It is the same in respect to the Pleiades, which are said to occasion rain, and all the other constellations, to which they impute effects that in reality only belong to the seasons in which these stars rise or set.—If then the planets and stars have no part in the temperature and natural revolutions of our globe, they can have still less upon human actions. The happiness or unhappiness of individuals,

or of whole nations, depend partly on natural talents and passions, partly on the combination of certain moral and natural circumstances; but the stars can have no influence upon any of these. If they had, we might be led to doubt the rule of Providence, and to believe, that the world is not governed by a Being infinitely wise, good, just, and powerful. Who would wish to inhabit a globe where all its revolutions depend on a blind chance, or on the influence of the stars, which must be fatal both to our natural and moral state. Let us leave to the superstitious this science so humiliating to the human mind, and so destructive to peace, which they call astrology, and which in reality is only a wretched abuse of astronomy. As for us, our surest foundation for happiness is to know, that we live under the guidance of a wise, just, and good God, who directs all things.



DECEMBER XX.

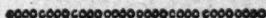
THE POLAR STAR.

NONE of the northern constellations are more remarkable than that which is nearest to the arctic pole, and is called the *lesser bear*. The extremity of its tail is but two degrees from the pole, and, for that reason, it is called the *polar star*. It is easy to distinguish it from the stars near it, because it changes its position very little,

and it is always seen to towards the same point in the heavens. It is true, it turns round the pole, but its motion is so slow, and the circle it describes so small, that it is scarce perceptible. As it is therefore visible always in the same point of the sky, it is a sure guide to the mariner, particularly in the open seas. Before the discovery of the compass, the sailor had no surer guide than the polar star; and, even at this time, when the sky is serene, they may on many occasions better depend upon it than on the magnet. This reflection naturally leads us to admire the goodness of God, who, by the situation and course of the stars has given us such a sure knowledge of times, places, and the different points of the sky. An astronomer, though in an unknown country, can tell by the stars exactly where he is. He can know the month, the day, and hour, as certainly as if he had consulted the best watch. If, for example, we only observe that the stars come every day four minutes sooner to the place where they were the day before, we consequently know that this makes two hours in each month. Thus, the star which we see this night at ten o'clock, in a certain part of the sky, we shall see it again, the 20th of January, at eight o'clock, if we observe it from the same place we are now in. The star, which is now at midnight to be seen over our heads, will a year hence be in the same spot.

Let us here acknowledge God's mercy towards all the world. How much those would deserve pity who have neither clocks or geographical

maps, if they could not supply the want of them by the observation of the stars. If we put ourselves in the place of those people, these reflections cannot appear indifferent to us; for we must be devoid of all feeling or humanity, if objects which do not, indeed, directly concern us, but which interest so many of our fellow-creatures, should appear unworthy our attention.



DECEMBER XXI.

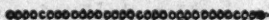
EFFECTS OF THE AIR WHEN CONFINED
IN BODIES.

THE effects of air inclosed within bodies are very astonishing. Nobody is ignorant of what happens when fluids are frozen. Water, when in that state, generally breaks the vessel it was put into. A musket-ball, if the mouth of the musket is hermetically sealed, bursts with great violence in severe cold. This appears at first incomprehensible. We know that water is not fluid of itself, but is made so by means of the fire, which penetrates into every part of it; consequently, it becomes a solid mass when it is stripped of the fiery particles, or when its motion ceases through excess of cold. It seems, then, as if the particles of water must draw closer, and condense, and, of course, that the frozen bodies should occupy less space than they did before: Yet, they certainly dilate, and their

size increases by freezing, otherwise it would be impossible they should burst the vessels. Besides, how could the ice swim at top, if it did not increase in size, and if it was not of course lighter than water? But what then is the cause of this effect? It is the interior air. It is impossible to impute it to any exterior cause. It is not the cold; for this is no real Being nor positive quality; and, properly speaking, it cannot penetrate into bodies. It is equally certain that heat is not the cause of this phenomenon. The air cannot insinuate itself into vessels of metal or glass, hermetically sealed, and yet ice forms within them. We must therefore seek the cause of it in the air which the water itself contains, when thus shut up. To be convinced of it, we need only observe water beginning to freeze. The first coat of ice is scarce formed, when the water begins to be agitated, and a number of little bubbles rise upon it; this upper crust of ice often rises up in the middle, and cracks; then the water rushes out at the opening, flies against the vessel, and while running down the sides, it freezes: This makes the water appear high and convex in the middle. These are all effects of confined air; effects which would not take place, or at least but in a very small degree, if, before the water had frozen, all possible air had been drawn out of it. From hence, it is very easy to explain many singular phenomena. A severe cold is very hurtful to vegetables. We know that there is a sap which circulates in all plants,

that it thickens a little in winter and autumn, but is still fluid: Extreme cold turns this sap into ice, and by doing so, swells its size very much, which must necessarily burst and cut some of the fibres and stalks of the plants. It is evident then, that when the sap in spring becomes fluid again, it cannot circulate properly, no more than the blood of an animal whose veins were cut. The growth of the plant being thus put a stop to, it dies, because the nutritive juices no longer flow through its vessels: Let us observe, however, that even this cold, which is prejudicial to plants, may in some respects become very useful to the earth. A field, plowed before winter, is better disposed to receive the autumn rains, and to let them sink into it. If a frost succeeds, the particles of the earth dilate and separate, and the spring then completes the making the earth light, moveable, and fit to receive the benefit of the sun and the fine weather. Enough has been said to convince us of the power of air, and of that expansive quality from whence results so many advantages to our globe. The property this element has of condensing and rarefying so wonderfully, is the cause of the greatest revolutions in our world. It is but in a very few cases that the force of this fluid can become hurtful, and even then, the evil is more than compensated by the advantages which result from it. But it must be confessed, that in this, as well as in every other phenomenon of nature, there remain still many things that are inexplicable. All that we

know of the nature, properties, and effects of air, are reduced in a great measure to probable conjectures, which will be verified perhaps in future, or possibly may be proved, by those who come after us, to have been ill judged mistakes. How careful should we therefore be, when we contemplate God's works, to come prepared with humble minds, and the diffidence of our knowledge, remembering always the weakness of the human understanding, and the uncertainty of our judgements and systems. In respect to any science, presumption is inexcuseable; but it becomes absolutely ridiculous, when the knowledge of nature is in question.



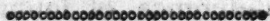
D E C E M B E R XXII.

M U S I C.

WE owe to music one of the most pure and innocent pleasures we can enjoy. It has powers to charm the ear, to calm the passions, to move the heart, and to influence the temper and disposition. How often does music suspend grief, animate the spirits, and ennoble our sentiments. An art so useful and pleasing is worth our attention, and should be made use of to praise our beneficent Creator. But from whence proceeds the impression which music makes upon the ear? It is an effect of the air which receives an undulating motion, and which strikes our auditory

nerves in different ways. When a tight cord is pulled, it changes its form; for its elasticity makes it not only go back to its first place, but makes it also extend beyond it to the other side; and it continues vibrating back and forward till it recovers the state it was in before it was touched. These vibrations communicate with the air, which conveys them to other contiguous bodies. For example, when an organ is played on, the strings of a lute, if near it, are put in motion, and make a sound. But what occasions the difference of sounds? Why are some sharp and others flat; Is it not the quantity of air put in motion, for a sound may be sharp and flat, and at the same time weak or loud: Neither can it be imputed to the swiftness of the undulations by which the sound is propagated in the air; for a sharp note does not go more rapidly from one place to another than a flat. The difference proceeds then from the quickness of the fluttering of the air. A sonorous body makes a sharp tone when the vibrations of its parts are quicker, and a flat one when they are slower. But why are certain sounds, when united together, harmonious and pleasing by their concurrence, whilst other sounds make discord and wound the ear? The only answer to this is, that the natural character of harmony consists in being in the same key; while, in discordance, on the contrary, though the notes are struck at the same time, they disagree, and produce a double sound to the ear, which effects it unpleasantly.

But of what use would the harmony of sounds be, if we could not distinguish them from discord? Let us therefore bless God for having enabled us to receive and distinguish the different impressions of sound, and for having given to our souls the power of associating certain ideas with bodily sensations. How many pure and innocent pleasures he has given us to enjoy; let us express our sense of it by making use even of music to celebrate his goodness.



D E C E M B E R XXIII.

COMPARISON OF MEN AND ANIMALS.

IN the comparison we are going to make between men and animals, there will be found some things which are in common with us and the brute creation; others in which they have the advantage over us; and, finally, some in which we are superior.

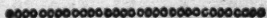
Man chiefly resembles animals in respect to matter. We have (like them) life and organized bodies, which are produced by propagation and birth, and supported by food. We and they have also alike animal spirits, powers to fulfil the different functions assigned to us, voluntary motions, the free exercise of our limbs, senses, sensation, imagination, and memory. By means of the senses they, as well as we, feel the pleasure and pain which makes us desire certain things

and fear others. A natural instinct prompts us, as well as them, to preserve our lives, and to continue our species. Lastly, we are equally liable to those general bodily accidents which the chain of things, the laws of motion, the construction and organization of our bodies, must necessarily occasion.

In respect to the happiness resulting from sensual pleasures, animals have many advantages over us. One of the chief is, that they do not require the clothes, defence, and conveniences we want; nor are they obliged to invent, to learn, and exercise the arts necessary for these purposes. At their birth they bring with them every thing they want, or, at least, have only to follow the instinct which is innate in them, to obtain all that can make them happy. This instinct never deceives them. It is a constant sure guide. And as soon as their appetites are satisfied they are perfectly content, they desire no more, and are never guilty of excess. They enjoy the present without troubling themselves about futurity. There is every reason to believe that animals have not the faculty of representing to themselves the future. A sense of the present warns them of their wants, and instinct teaches them how to supply them. They procure what they desire, and enjoy it with satisfaction. They never think of the morrow. Death itself comes upon them without their having foreseen it, or being disturbed about it before-hand. In all these circumstances they have the advantage of man, who

must reflect, invent, labour, exercise, and receive instructions, or he would remain in perpetual childhood; and could scarce procure himself the necessaries of life. His instinct and passions are not sure guides to him. He would be wretched were he to give way to them. Reason alone, and its consequences, make the essential difference between him and the brutes. It supplies all deficiencies; and, in other respects, gives a superiority to which they can never attain. By means of this faculty he not only obtains every necessary and convenience, but also multiplies the pleasures of sense. It ennobles them, and makes them so much the more sensibly enjoyed, as he can render his desires subservient to reason. His soul is capable of pleasures entirely unknown to animals. Pleasures which spring from science, wisdom, order, religion, and virtue; and which infinitely surpass all those of which the senses are the organs: Because, far from being contrary to the real perfection of man, they continually add to it; because they never forsake him, not even when his senses, deadened by sickness, old age, or any other circumstance, become insensible to all animal enjoyments; because, in fine, they make him more and more resemble God; whilst, on the contrary, the more he yields to sensual pleasures, the more he degrades himself to the likeness of a brute. Let us add, that animals are confined within a very narrow sphere; that their desires are very few, and consequently

their pleasures are little varied ; whereas man has an infinite number of them. He draws some out of every thing, and there is nothing which he cannot make use of some way or other. He alone can improve himself more and more. He makes continual new discoveries, acquires further lights, and makes boundless progress in the road to perfection and happiness ; whereas the beasts are always confined within their narrow limits, never invent or improve, nor ever rise above other animals of their species. It is reason alone, then, that gives us the superiority over the brute, and it is in this that the excellence of human nature mostly consists. To make use of our reason in order to ennoble the pleasures of sense, and to enjoy more and more those that are intellectual, so as to improve daily in wisdom and virtue, this is what distinguishes man. This is the end for which he was created. Let it then be our constant study to answer this purpose ; for we can only be happy in proportion as we follow what reason points out to us as useful and right.



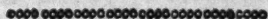
DECEMBER XXIV. .

CALCULATION RELATIVE TO THE RESURRECTION.

WITH what a crowd of human creatures will the place where our city is situated be covered, at the great day of resurrection ! What multi-

tudes spread over the whole earth, prodigious indeed, but not innumerable ; for each of the dead that rise will be known by the Lord his Judge : Each name is written in his book : None will fail, none will be lost ; not one of those, whose bodies were laid in earth, can escape his all-seeing eye. Supposing Germany, our country, to have only begun peopling 500 years after the universal deluge, consequently, within about 4500 years, and that from the foundation of our city to this time, even to the day of judgement, (if it was to happen this year) there had been annually buried, reckoning one year with another, only 200 people, the number of dead would amount to 900,000. If then our single city would already furnish 900,000 persons for the day of judgement, how great a number would all Germany produce ? In admitting the number of inhabitants to be about 24 millions, we cannot reckon our city to be more than the three thousandth part of the whole. If that is the case, one may suppose, from the foregoing calculation, that Germany would furnish 2100 millions. This number is certainly prodigious, and yet what is it, in comparison of what the whole earth contains, which is reckoned to be at present more than 1000 millions. If we fix it at this number, and calculate it as above, the total of those who have died, during the above-mentioned space, must amount to 87500 millions. If we afterwards add to it those who lived before the flood, and those who died after it, in the space of 500

years, a number which may be reckoned as a quarter of the preceding, the total then will come to 109,375 millions. Lastly, let us add to it the inhabitants of the earth, who may be living at the day of judgement, and only fix the number as before at 1000 millions, and the whole will amount to 110,375 millions. Now, let our imaginations soar, and if possible, figure to ourselves this prodigious multitude, which will appear at the last day before the Judge of the world. How great must that Intelligence be, which can look into the minds of every individual of which this multitude will be composed ! who will know exactly their thoughts, words, and actions ; who will perfectly remember the day of their birth, the duration of their existence on earth, the time, manner, and circumstances of their death ; who will be able to distinguish the atoms so dispersed from each of them, to separate, to unite them again, though their bodies had been reduced to ashes, dissolved into a million of parts, and undergone numberless transformations ! What an almighty work, to collect these earthly atoms, to purify them, to ennoble, and to form them for immortality !



DECEMBER XXV.

THOUGHTS ON CHRISTMAS DAY.

WHAT sentiments of gratitude and joy arises in my soul this day, on which we celebrate the

birth of Jesus! But, at the same time, what is my surprise, when I reflect on the circumstances which attended this great event? I behold a Son of man in the lowest state of humiliation; and this Son of man is my God! I behold the mighty, the invisible God, at whose word the heavens and earth were made; at whose word they will fade away! And I see at the same time, a Being, visible, weak, and clothed in flesh, as I am! How wonderful is this union, the King of kings, whom angels adore, appearing under the form of a servant! A child, weak, destitute, shedding tears, lying in a manger! What astonishing humiliation! Human nature, so limited, so corrupted, risen with Jesus Christ upon an eternal throne of glory! What a miraculous change! But, can I well comprehend the greatness of this divine mercy? or rather, does not the astonishment and admiration, with which they inspire me, doubly encrease, when I reflect on my own unworthiness, and the infinite majesty of our Saviour? Certainly, it was a love which infinitely surpasses all I can merit; a love beyond all I could conceive or hope; a love which I have only silently to admire and adore. But, if my sense of this goodness is great, my joy and hope are no less so. In this union of God and man, I behold the joyful emblem of the new covenant. Faithful to his promises, God has sent his Son into the world, that through him we may have eternal life: And, have we not assurance, that all which was promised in his name will be ac-

complished with equal fidelity. Christ would never have honoured our nature so as to unite it with his own, had he not resolved to cure our infirmities by his power, to pardon our faults, to wipe out our sins, and thus to restore human nature to its original purity and innocence. What then is more natural and just, than to give ourselves up entirely, on this solemn day, to a sense of pious gratitude? It is true, that little is in our power to return for such inestimable love; but, let us at least do that little, and hope that our weak, but sincere gratitude, will be pleasing in his sight. Such are the sentiments which we ought to celebrate this solemn festival. They ought to spring from a lively faith. Let not our admiration be the fruit of ignorance, but of an enlightened conviction. Neither let our hope be the effect of a blind persuasion. If it is the work of a pure faith, what sweet consolation, what heavenly joy will fill our hearts! It will enable us to support every evil in life, because it is a felicity which nothing can destroy.

DECEMBER XXVI.

THE PLACE OF OUR SAVIOUR'S NATIVITY.

IT seems at first sight to be of little consequence to us to know the place of Christ's nativity; for we should still consider him as our Redeemer, whatever the circumstances might be which at-

tended his mortal life. But since it pleased God to declare the place in which the Saviour of the world should be born, it became necessary that it should happen precisely there, and it was one of the characters by which Christ was known to be the true Messiah. It is also of little importance to us what place we ourselves live in, provided we find true happiness. There is no part of the earth, however poor and despicable, where there may not be better and happier people than some of those in the greatest and most celebrated cities. Do we know a single spot on our globe where the works of God do not appear to us under a thousand striking forms? and where we might not experience the sweet satisfaction which flows from a good conscience? For each individual, the place preferable to all others is that in which he may enjoy the most health, and do the most good. For a whole nation, it is the place which contains the greatest number of wise and virtuous men; for every nation declines in proportion as religion and virtue lose their influence over them. The place where a young man may, for the first time, have contemplated the morning dawn of nature, renewed with the most lively sensations of pleasure, and adored God with all the love and veneration his heart was capable of; the place where a virtuous pair first learned to be acquainted, or that were two friends gave each other the noblest and most affecting proofs of tenderness; the village where any one may have seen, or may himself have

given, remarkable examples of goodness, justice, and patience; such a place, ought it not to be dear to their hearts?—According to this rule, Bethlehem was, though small, a venerable place, as it contained many good and pious people. The patriarch Jacob staid there some time, in order to erect a monument for his beloved Rachael. It was at Bethlehem that the worthy Naomi, and Ruth her modest daughter-in-law, gave proofs of their faith and virtue. And it was there Boaz, that generous benefactor, lived and had his possessions. Bethlehem was the abode of the humble Jesse, the happy father of many sons, the youngest of whom rose from the state of a shepherd to the throne of Israel. It was there that was born the Prince Zerrubbabel, that descendent of David, who was the type of that Ruler and Shepherd about whom Israel was one day to be assembled, and live happily under his government. Lastly, appeared the Son of God, whose birth laid the foundation for our redemption. Thus, in places too small to be remarkable, men are sometimes born who afterwards become the benefactors of mankind. A village often produces a man, who by his wisdom, uprightness, and heroism, becomes a blessing to whole kingdoms. It is certain, that true piety would make a rapid progress over the earth, if we every where endeavoured to give proofs of innocent morals. If our cities furnished more examples of virtue, their influence would extend to the country; and in the smallest village there

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DECEMBER XXVII.

CARES OF PROVIDENCE TOWARDS MAN- KIND FROM THEIR BIRTH.

WHAT a multitude of wants we have at our birth ! We do not even come into the world

without assistance ; and we should soon lose the life we receive, had not many necessities been prepared before hand for us, and were we not in this helpless state to be under the protection of others, or rather, were we not preserved by our heavenly Father himself, who took care of us, even in our mother's womb, but whose great mercies extend still farther than the moment of our birth. At that period, was laid the foundation of all our future happiness. Weak, poor creatures, we neither did nor could know what our fate would be ; but all was perfectly known to God. He saw the whole of our lives ; all the contingencies and future events, with their consequences and connections. He knew what would be best for us, and regulated our state accordingly ; and, at the same time, determined on the means he would make use of to procure us the blessings his goodness designed us. From our very birth, the causes existed which were to influence our future happiness, and they already began to act conformably to his-views. How much does the happiness or misery of life depend on our parents, their way of thinking, situation, &c. ? How much the education we received in our youth, the examples we had, the connections we formed, the opportunities which presented of exercising our powers and talents ; how much does all this influence the happiness of our lives ? Is it not God that prepares all these circumstances for us ? If he has watched over our happiness, he has with equal goodness directed those events

which may have appeared unfortunate to us. He has foreseen and ordained all of them ; he has dispensed them with wisdom, and from motives of mercy. They were prepared for us from our birth. He knew that adversity was good for us. He knew when sorrows were to begin, and the sources from whence they would spring, as well as the consequences of them. These causes for some time act in secret. By degrees they unfold, and we may know, and acknowledge, that our distresses and sorrows were necessary to our real happiness. But they would not have had such salutary effects, without the concurrence of many causes which acted remotely a long time before, and were unknown to us. This reflection ought naturally to fill our minds with tranquil hope. What can be more comfortable, than to be convinced that there is an invisible Being, who protects us ? a Being infinitely good, wise, and powerful, who watched over us, even in our mother's womb ; who, from that moment, settled every thing necessary for us during our lives ; who has reckoned our days, and appointed a term for them, that no human power can change ; who has ordered all for our temporal and eternal happiness. How unshaken must be the peace and confidence which rest on such a persuasion !

DECEMBER XXVIII.

TERM OF HUMAN LIFE.

EVERY man dies precisely at the time God has decreed he should. As the time of our birth is fixed, so is that of our death. But the term of our lives does not depend on inevitable fate. There is no such thing in the world. Every thing that happens might happen sooner or later, or even not happen at all. It might always be possible, that the man who dies to day had died sooner, or lived longer. God reckons not any body's days by an absolute and arbitrary decree, or without respect to circumstances. He is an infinitely wise God, who does nothing without motives worthy of himself. He must therefore have had just reasons for decreeing that such a person should quit the world at one time rather than at another. But though the term of life is neither from necessity or fatallity, it is not the less certain, and is never in reality changed. When a man dies, there are always causes which infallibly bring on his death, unless prevented by a superior power. One person dies of a mortal disease; another by a sudden and unforeseen accident. Some perish by fire, and some by water. God foresees all these causes. He is not an idle indifferent spectator of them. He examines all with care; he compares them with his designs, and sees whether he approves them or not. If he approves them, he determines them

accordingly ; and there exists a divine decree, by virtue of which the man dies at such a time, or by such an accident. This decree cannot be revoked or prevented, because the same reason God has at present for taking a man out of the world was known to him from all eternity. He judged of it then as he does now ; and, of course nothing could induce him to revoke his decree. But it is possible, that God may not approve the causes of man's death when he foresees them. In this case, he determines at least to permit them, or they could not happen, and the man would not die. But if God resolves to permit those causes of death, it is his will that we should die at the time in which the causes existed. In reality, he was disposed to grant us longer lives, and does not approve these causes of our death ; but it was not consistent with his wisdom to oppose them. He sees the universe in the whole, and finds reasons which engage him to permit men to die in such a time, although he neither approves the causes, manner, or circumstances of their death. His wisdom finds means to direct these deaths to useful purposes ; or else he foresees, that longer lives, under their circumstances, could neither be beneficial to themselves, or to the world ; or possibly he finds, that in order to prevent these deaths, it would require a new combination of things, such as would not agree with the general plan of the universe. In a word, though God sometimes disapproves the cause of a man's death, he has always just and

wise reasons for permitting it, and for decreeing consequently, that the man should die at such a time, and in such a manner. These reflections are calculated to make us meet death with Christian fortitude. What renders death dreadful is chiefly the uncertainty of the time and the manner of it. If we knew beforehand when or how we should die, we should expect death perhaps with more firmness, and should fear it less. Now, nothing can more effectually encourage and calm our minds in this respect, than the persuasion that a Providence watches over us, who, from the foundation of the world, decreed, with infinite wisdom and goodness, the time, manner, and every circumstance of our deaths. An almighty Providence watches over our days, and prolongs or shortens them as he thinks best for us, as well in respect to this world as the next. Persuaded of this comfortable truth, we may quietly expect death ; and since the hour of it is uncertain, let us be prudently prepared to meet it at any time. We are ignorant, it is true, what kind of death it may be ; but it is enough to know, that we can only die in the way that the merciful Ruler of the world judges best for us, and for those belonging to us. Supported by this thought, let us submit to the dispensations of Providence, and not fear any dangers to which our duty calls us.

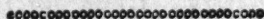
DECEMBER XXIX.

INSTABILITY OF EARTHLY THINGS.

THERE is nothing in nature that is not liable to change. Every thing is uncertain and frail. Nothing is durable enough to remain always like itself. The most solid bodies are not so impenetrable, nor their parts so closely united, as to preserve them from dissolution. Each particle of matter insensibly changes its form. How many changes has each of our bodies undergone since its formation in our mother's womb? Every year it has lost something of what made a part of itself, and has acquired new parts drawn from mineral, vegetable, and animal substances. Every thing on earth increases and decreases by turns; but with this difference, that the changes do not operate as quickly in some bodies as in others. The celestial globes appear to be still the same as at the moment of their creation, and they are, perhaps, the most invariable of all bodies. Those however who have observed them with attention, perceive that some stars have disappeared, and that the sun has spots which change, and thus they prove that it is not constantly the same. Its motion also makes it liable to variation; and though it is never extinguished, it has been obscured by fogs, clouds, and even by internal revolutions. This is all we can know of it at the immeasurable distance there is between us. How many other external, as well as internal changes we should discover, were

we nearer? If we are still more struck with the instability of earthly things, it is because they are within our view. And how frail are these! How liable to change! Each object continues to look like itself, and yet how different in reality is it from what it was? We daily behold things taking new forms; some growing, others diminishing and perishing. This year, which in two days will be at an end, affords undeniable proofs of it. In each person's own little circle they must have experienced many revolutions. Several of those we had known for many years are no more. Many whom we have seen rich are become poor, or, at least but in an indifferent situation. If we examine ourselves also, we shall find a difference in many respects. Has not our health and activity diminished? And are not all these things warnings of approaching towards that great and final revolution which death will operate upon us. Besides, there are many changes may still happen in the three remaining days of this year. We may become poor or sick; we may experience the infidelity of friends, or die even, in that space of time. Many things certainly may happen which it is at present impossible to foresee. Such reflections must inevitably oppress and sink us to despair, if religion was not our support and consolation. But this leads us to look up to the only invariable, everlasting Being, whose very nature is immutability, and whose mercy has no end. Full of confidence therefore in his unchangeable goodness, let

us submit with resignation to all the changes of this transitory world.



DECEMBER XXX.

CALCULATION OF HUMAN LIFE.

THE approaching close of the year leads me to reflections which, however important they may be, do not always occupy me as they ought. In order to feel more sensibly how short the date of life is, I will examine the use I have made of the past days; though I have reason to believe it will prove a subject of humiliation to me.—I first recall to myself those days it was not in my power to command. How many hours, then, employed in mere bodily wants? How many more have passed in trifling occupations of no service to the mind? Thus, in slightly looking over the use made of these years, I discover a multitude of days lost to the immortal soul, which inhabits this body of clay; and, after these deductions, what will remain which I may justly say have been employed for real happiness? out of 365 days, it is plain, that I can scarce reckon fifty. And the little that remains of time, how much do I lose of it by my own fault and weakness. How many days sacrificed to vice and folly. Per-

haps many of those granted me for reflection have been devoted to the world, to vanity, idleness, and false pleasures. Perhaps they may have been profaned by impurity, envy, jealousy, slander, and other vices, which betray a heart void of respect for God and charity to our neighbour. Even when inspired with a desire to walk in his paths, how much time is irrecoverably lost in thoughtlessness, indifference, doubts, anxiety, want of temper, and all those infirmities which are the effects of frailty. Lastly, how swiftly does the little space of time we can dispose of fly away! A year passes almost insensibly; and yet a year is of great consequence to a Being whose life is reckoned by hours. Before we have well thought of it, a year is gone. When we recollect how little of it we may have spent suitably to the purposes of our creation, we may well wish to recall those hours which were ill employed. But it is in vain. The year, with the good and bad actions which have marked it, are swallowed up for ever in eternity.

Let this awful thought influence our minds so as to redeem the time we have lost.

DECEMBER XXXI,

CLOSE OF THE YEAR.

HAVING given some hours every day in the year to the study of nature, it will not perhaps be displeasing to the reader to recapitulate the 12 months, in an allegory pointed out by Monf. de la Court de Gibelin, in his “*Monde Primitif*.” He considers symbols and allegories, such as the scriptures are full of, as a key to all the knowledge of ancient times; in which notion he is not singular. I can here only give his account of Hercules, whom he considers as the emblem of agriculture, or man so employed, and the 12 labours, as the employments of the 12 months. I shall begin the year at the autumnal equinox.

The Nemean Lion 1st. Labour. September & October.

The heat and toil of harvest being ended, man rests for a short time, and the lion, a known emblem of heat, is said to be conquered by Hercules.

Hydra of Lerna. 2d Labour. October & November.

Moisture and heat produce vermin and insects. The riches of the field and garden are threatened

with destruction. Hercules must defend them from these enemies, which, like the Hydra's heads, increase as fast as they are destroyed.

Battle of the Lapithæ and Centaurs. 3d Labour.

By this symbolical creature, is represented man, whose sensual part carries away the rational, especially when wine, and the indulgencies allowed at the time of vintage, invite him to excess. This Hercules must conquer or die.

Silver-footed Doe. 4th Labour. December.

Hunting, now considered only as a pleasure, was at first a business of consequence, and these the fittest months for Hercules to conquer his ferocious enemies, and provide food and clothing.

The Birds of the Lake. 5th Labour. Jan. & Feb.

The birds begin now to multiply, and though friends to Hercules in some respects, are in others very dangerous foes. Timely foresight must conquer this enemy.

The Augean Stable. 6th Labour.

It is strange that this story, at least, should not point out the whole to be an allegory. What can be more ingenious than the contrivance of rafts, to convey by water the necessary but offensive manure? The cleansing a stable, by passing

a river through it, (when taken in this light) is a labour worthy Hercules.

The Cretan Bull. 7th Labour. March & April.

The humble ox, submitting to the yoke, is the furious bull tamed, and made useful to man. Hercules can now plough and sow, and with pleasure pursue the necessary toil of this season.

Diomedes's Mares. 8 Labour.

To tame the horse, the dam must be laid hold of when with colt, that the young one may be educated by man, and not left wild in the forests. The pleasure this creature bestows, and its use in country affairs, must deservedly place the conquest of its species among the victories of Hercules,

War with 12 Amazons. 9th Labour. May & June.

The sun (the soul of Agriculture) now at the solstice, may be said to be the conqueror of the 12 months, and of their attendant labours; though the beginning of the year is not here placed at this season, nor perhaps ever was. Mons. le Court's allegories on the Sun, Adonis, Osiris, &c. would here take too much room.

Geryon's Cows. 10th Labour.

This name signifies abundance, a heap; and Isis, the cow, the emblem of fecundity. The

time of planting is also the time of foresight. The dairy must be attended to. The art of preservation is no small part of the husbandman's care.

Cerberus brought up from Hell or Hades. 11th Labour. July & August.

Hades means a hidden place, the lower hemisphere, and the place of departed spirits. Cerberus is the dog-star raging at this time.

Hesperian Gardens guarded by a Dragon. 12th Labour. August & September.

The great abundance of fruits, &c. are well expressed by the rich garden; the necessity of defending them from theft, or imprudent waste, is the dragon. The pillars express the pious confidence of the cultivator, (Hercules) trusting to divine providence for the same return of yearly blessings, if not wanting in his own endeavours.

Besides the labours of Agriculture, (or Hercules) we are to consider his birth and latter end, followed by his apotheosis. Two serpents, the emblems of the two luminaries which direct the year, are placed in the hands of a child, to point out the origin of time. Hercules, on the funeral pile, weary of life, expresses to the eye the end of all things by fire, and these words of the "patriarch, "I am but dust and ashes:" dust in the beginning, ashes in the conclusion.

If we are, with Monf. Gibelin, to take the heathen mythology as a lesson of virtue and industry; or, as the wisdom as well as the folly of the ancients, according to Lord Bacon, we may learn to consider our great Creator, not as a careless Jupiter, indulging sometimes sleep, but as a tender Parent, guiding and supporting helpless creatures; providing pleasure and instruction in every object; allowing long life, even after they fall, for the perfectioning of every art and science; and withdrawing no means of happiness, till ungratefully abused; and still preserving to us the glorious hope of happiness, after death, pointed out by the reception of Hercules into heaven, of patient toil and industry, rewarded by glory.



END OF VOLUME THIRD.

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